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IN THE MATTER OF:)

) Docket No.

DETERMINATION OF CABLE) 14-CRB-0010-CD

ROYALTY FUNDS) (2010-2013)

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BEFORE: THE HONORABLE SUZANNE BARNETT

THE HONORABLE JESSE M. FEDER

THE HONORABLE DAVID R. STRICKLER

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Washington, D.C.

March 1, 2018

9:06 a.m.

VOLUME VIII

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PROCEEDINGS

(9:06 a.m.)

JUDGE BARNETT: Shall we march on? Get it?

Mr. Cho.

Whereupon--

GREGORY CRAWFORD,

a witness, called for examination, having previously been duly sworn, was examined and testified further as follows:

CROSS-EXAMINATION

BY MR. CHO:

Q. Good morning, Dr. Crawford.

A. Good morning.

Q. My name is Dustin Cho, and I represent the Public Television Claimants.

A. Nice to meet you.

Q. The last time I was up here with a witness that spilled over from the day before, she wanted to start by elaborating or clarifying some of her testimony. So I thought I should give you the same opportunity first. Is there anything you want to elaborate or clarify from the day before? Of course, it is perfectly fine if you don't wish to.

JUDGE BARNETT: I'm sorry; before we even ask the question. With regard to Mr. MacLean's oral motion yesterday, this is not something we can handle unless we have it in writing.

MR. MacLEAN: You Honor, we filed our motion in writing this morning, taking your hint from yesterday. And so it's -- it's been filed.

JUDGE BARNETT: Thank you very much.

MR. STEWART: Your Honor, we are responding in writing, as well.

JUDGE BARNETT: I appreciate that. And that having been said, of course, we are going to complete Dr. Crawford's testimony and make the decision after the fact, as we have done at times in the past.

Now, I'm sorry, Mr. Cho -- oh, Mr. MacLean, you have an objection to the question?

MR. MacLEAN: Yes, your Honor. The question is broad and vague and basically allows the witness to question himself. I'd ask that the question be something that we can understand and respond to, without simply

opening the floor to the witness.

MR. CHO: Your Honor, I am just asking the witness to clarify his remarks, if he wishes to do so.

JUDGE BARNETT: Overruled.

THE WITNESS: So I have nothing to say at this time -- I have nothing to say at this time.

BY MR. CHO:

Q. Well, one thing I do want to clear up at the outset -- I don't know if we can pull up Slide 1. Yesterday, you agreed with Mr. MacLean that this issue was very important, and so I want to touch on this right away.

Mr. McLean repeatedly suggested that the minimum fee might be calculated on a subscriber group basis rather than on a systemwide basis, as you had testified. And on the screen is an excerpt from Exhibit 4009, which is the testimony of Jonda Martin, the President of Cable Data Corporation. And she states, "Only the minimum fee should be calculated on a systemwide basis without reference to subscriber group." Is that consistent with your testimony yesterday?

A. Yes, it is.

Q. And in fact, if we view the next slide, if you look at the Statement of Account form, Form 3, that is attached to Exhibit 4009 at page 39, it is clear from Form 3 that the minimum fee is calculated on a systemwide basis, as you testified; right?

A. That's correct. And this is the form I was familiar with in my memory.

Q. Thank you, Dr. Crawford.

JUDGE FEDER: Dr. Crawford, is your mic on?

THE WITNESS: I don't know. I will move it a little closer.

BY MR. CHO:

Q. So I want to start out by looking at Figures 11 and 12 of your Direct Testimony on page 25. Do you have that in front of you?

A. I see the image on the screen, yes.

Q. So Figure 11, which is at the top of the slide, shows each Claimant group's share of the minutes of their programming that were broadcast multiplied by the number of distant subscribers who receive that programming; right?

A. Weighted by the total subscribers at the system level -- or at the subscriber group level. Excuse me.

Q. Right. So I guess that is sort of what my question is trying to get at. It is the minutes of the programming that were broadcast multiplied by -- and that is the weighting -- multiplied by the number of distant subscribers receiving that program. Is that how the weighting is done?

A. Yes, that's correct.

Q. So, for example, if there is a station that carried only 1,000 subscribers on a distant basis and one minute of that station programming is transmitted to those 1,000 subscribers, that counts as 1,000 distant minutes for this table?

A. For this table, yes.

Q. Whereas, if it is a widely carried station like WGN that goes to 40 million distant subscribers, then 1 minute of WGN would actually count as 40 million distant minutes on this table?

A. That's correct.

Q. Figure 11, the one on the top, does

not account for the fact that most of the programming minutes on WGN are non-compensable; right?

A. That's correct. It reports the share of total minutes.

Q. So then Figure 12, which is below that, that shows the shares of only the compensable distant minutes?

A. That's correct.

Q. And Program Suppliers and Devotional shares of the minutes fall by nearly half?

A. Yes, I see that, yes.

Q. And everyone else's share actually more than doubles?

A. That looks to be -- yes; correct.

Q. And is it your testimony that the Public Television category accounted for 36.3 percent of the compensable distantly retransmitted programming minutes that CSOs chose to carry in 2010 through 2013?

A. When weighted by subscribers, yes.

Q. Did Public Television account for the largest share of compensable distantly retransmitted minutes during this period?

A. Yes.

Q. And from 2010 to 2013, there is a marked increase in Public Television's share of compensable minutes; is that right?

A. There is a modest increase. I mean, it's maybe 10 percent over -- well, no -- yeah, 10 to 15 percent over the three-year -- four-year period.

Q. It goes from approximately 32 percent in 2010 up to nearly 40 percent?

A. That's right. It's closer to 20 percent, excuse me.

Q. And you previously testified that -- if we could put up the next slide -- I think you previously testified that Public Television's type of programming is more likely to be considered niche programming, therefore is more profitable to cable systems than other types of programming; right?

A. Could I see the full context?

Q. I believe -- oh, has this been moved -- this is a Program Suppliers exhibit. Has this been moved into evidence? 6047?

JUDGE STRICKLER: What is this exhibit?

MR. CHO: This is his prior testimony

from 2004 to 2005 -- Dr. Crawford's prior testimony from 2004 to 2005.

MS. PLOVNICK: I believe this particular exhibit number hasn't been admitted into evidence; however, I think it may have been previously designated by somebody else. So it may already be in the record with another number, 40-something.

JUDGE BARNETT: Okay. Somebody in the room designated Dr. Crawford's prior testimony. Who are you and what number is it?

(Laughter.)

MR. COSENTINO: I think it is us, your Honor. Let me find it.

JUDGE BARNETT: Thank you.

MR. CHO: I apologize.

JUDGE BARNETT: It's okay. It's just we want to de-duplicate to the extent that we can.

MR. COSENTINO: This is the 2004-2005?

MR. CHO: Yes, rebuttal.

MR. COSENTINO: Rebuttal of Dr. Crawford? This is Tab A to Exhibit 4005, which is the Direct Statement of Dr. George.

JUDGE BARNETT: And is 4005 previously

admitted?

MR. COSENTINO: Yes, it is, your Honor.

JUDGE BARNETT: So it is already in the record. So, Mr. Cho, if you could --

MR. CHO: We will try to find that copy.

JUDGE BARNETT: -- mentally highlight the Exhibit 6047 and refer to it, rather, as an exhibit to -- rather, an appendage to Exhibit 4005, the record will be clear, we hope.

MR. CHO: Thank you very much, your Honor. May I approach the witness?

JUDGE BARNETT: You may.

THE WITNESS: I'm sorry; I'm doing damage to the binder here. Appendix A. Okay. Yeah.

BY MR. CHO:

Q. It's also up on the screen.

A. If you don't mind, I'll look at the full page.

Q. Of course.

A. Okay. I see the passage. Go ahead with your question.

Q. My question is that you previously testified that Public Television's type of programming is more likely to be considered niche programming and is, therefore, more profitable to cable systems than other types of programming; is that right?

A. Yes, that's what I testified previously.

JUDGE STRICKLER: You say in your testimony that we are looking at that that is a result of your research. The sentence begins, "My research" closed quote. Then there is a footnote. Do you then reference the research in Exhibit --

THE WITNESS: The research I believe is cited in the paragraph above, where it says, "The second condition, negative correlation, can in a recent article published in Quantitative Marketing and Economics."

JUDGE STRICKLER: Can we blow that up? I'm just trying to find that.

MR. CHO: Oh, I don't have a paper copy.

JUDGE STRICKLER: We will get up to speed and get it easier to read.

MR. CHO: This is the downside of using electronic versions.

JUDGE BARNETT: Well, if there is an earthquake, we won't be buried.

(Laughter.)

MS. PLOVNICK: You could use 6047 in paper and put it on the ELMO and we'll just pretend it's the other exhibit.

JUDGE BARNETT: Just like bankruptcy courts have jurisdiction. You learn to pretend.

(Laughter.)

BY MR. CHO:

Q. So I have up page 10 of what I believe is somewhere in this Exhibit 4005, and the footnote -- is that Footnote 24?

JUDGE STRICKLER: I think the witness did not agree with me that it was in the footnote. I thought he said it was in the sentence.

THE WITNESS: The footnote is referring to the same paper in the previous paragraph. So The same reference.

JUDGE STRICKLER: Okay. Why don't we start from the top and go back to your

testimony. Let's go to the sentence you were talking about. Where is that?

THE WITNESS: Sure. I think it was the previous paragraph. A little bit higher.

JUDGE STRICKLER: "The second condition..."?

THE WITNESS: That one.

JUDGE STRICKLER: And that first sentence suggests that we should be going back even further, doesn't it? "The second condition, negative correlation, can..."

THE WITNESS: If you like, I can summarize. Or we could go back.

JUDGE STRICKLER: Please.

THE WITNESS: So this is research that was looking to explore the economic incentives of cable systems to bundle cable networks. And one of the theories -- the ideas of the theory of bundling is that it makes tastes more homogenous and this can be profitable to cable systems, and it is widely believed to be one of the reasons that cable systems bundle.

This homogenizing account effect is stronger if there is negative correlation between the case for a given cable network and

the other elements in the cable bundle. So, therefore, the profitability effect is stronger if there is this negative correlation. So that is what this second condition says.

And in both my direct and rebuttal testimonies in this proceeding, I mentioned that there is a bundling premium associated with programming that can appeal to niche cases.

JUDGE BARNETT: Thank you.

DR. CRAWFORD: Of course.

BY MR. CHO:

Q. And, in fact, you give examples in that paper of particular channels or types of programming that are represented -- or are similar types of programming to Commercial Television Claimant programming, Joint Sports Claimant programming, and Public Television programming; is that right?

A. Let me see the example. Yes, I do.

Q. Thank you. If we could go back to the slides. Let's look at Figure 13 on page 26 of your Direct Testimony, Exhibit 2004. In this table, are you showing the average number of distant Public Television stations in each

subscriber group broken down to show the differences between different cable operator MSOs?

A. Yes, that's what the table shows.

Q. And if you look at the bottom right cell where it says .44, does that mean that across all the cable operators in 2010 to 2013 the average distant subscriber group carried .44 distant Public Television stations?

A. That's correct.

Q. And the 22 percent number below that, does that mean that the Public Television stations accounted for 22 percent of the distant signals per subscriber group on average?

A. That's correct.

Q. Now, in your testimony you observe that there is an upward trend in both the number and the share of distant stations that are Public Television stations during 2010 through 2013; right?

A. Yes.

Q. Is that upward trend for Public Television reflected in this far-right column?

A. I mean, the far-right column is the

average over the four-year period, so it would not reflect a trend within the period.

Q. Well, the first row shows .41.

A. Oh, I see, I'm sorry. I thought you meant -- yes, the final column reflects the upward trend.

Q. Thank you. So in your testimony, you also observe that since 2004-2005 -- the 2004-2005 decision -- there have been two new entrants to the cable television industry; right?

A. That's right.

Q. And those two new entrants were AT&T and Verizon?

A. That's correct.

Q. And those two entrants quickly grew to be among the largest pay TV providers in the United States by 2013?

A. According to -- yeah.

Q. I don't have a slide for it, but I believe it's Figure 7 on page 19 of your testimony.

A. Maybe we just look at that before I --

Q. Okay.

A. -- before I confirm without seeing the

numbers.

Q. I believe on Figure 7, page 19, you're showing the top MVPDs by share of the total MVPD subscribers. We will try to bring it up. Page 19.

A. So, can you repeat?

Q. My question is, those two entrants, the AT&T and Verizon entrants, grew to be among the largest pay TV providers in the U.S. by 2013?

A. That's correct.

Q. And, in fact, if we look at the right column of this Table 2013, Comcast -- that's a cable provider; right?

A. Yes, that's a cable priority.

Q. And then the next two, DirecTV and Dish, those are satellite providers?

A. Yes.

Q. And then after that is Time Warner, AT&T, and Verizon?

A. That's correct.

Q. So if we go back to my slide -- sorry -- Verizon alone actually accounted for more than 17 percent of the royalties paid in 2013, according to the next -- yes -- sorry.

If we could go to Figure 5 on page 17. Thank you. So Verizon alone actually accounted for more than 17 percent of the royalties paid in 2013, just Verizon?

A. That looks -- if I do the math of 108 divided by 744, that looks to be approximately right.

Q. And, in fact, if you look on the bottom line, Verizon alone accounted for about 14 percent of the total royalties paid for the full four-year period?

A. That's correct.

Q. So did Verizon carry significantly more Public Television stations than the other MSOs during this period?

A. That's my understanding.

Q. Yeah. And on average, did Verizon carry 1.38 distant Public Television stations to each of its subscriber groups?

A. As reported in my Figure 13, yes.

Q. I got it from your Figure 13. So Public Television stations actually accounted for more than half, that's that 53 percent number, of the average number of total distant stations that Verizon carried to its subscriber

groups?

A. I'm just reading the footnote to make sure I say the right thing. Yes, that appears to be correct, 52 percent of the distant stations choose -- Verizon subscriber groups were PTV stations.

Q. Now, you mentioned yesterday that you were familiar with the Bortz survey; right?

A. I am familiar in the sense that I read the results, but I did not do a detailed analysis of the entire study.

Q. Are you aware that in all four years, the Bortz surveys never surveyed a single Verizon system that carried any distant Public Television signal?

A. I'm not aware of the Bortz survey to that level of detail.

Q. Is it possible in your opinion that that omission -- just assuming that that omission is true -- is it possible that that could have biased the Bortz survey against Public Television?

A. I'm sorry; I don't feel confident to comment on whether the Bortz survey would be biased. I haven't analyzed it carefully.

Q. Well, okay. Now, the Bortz surveys focused their analysis on sampling and surveying entire cable systems. But even just among the largest MSOs, there can be substantial differences in the size and complexity of cable systems; right?

A. Yes, that's true.

Q. Let's first talk about size. For example, in Figure 8, which is up on the screen, you show that the size of the average Charter system is about 35,000 subscribers, whereas the average size of the Verizon system is more than 270,000 subscribers.

A. That's correct.

Q. But at the same time, Charter and Verizon actually had similar numbers of total subscribers during the 2010 through 2013 period?

A. Okay. That seems consistent with the figure you presented there.

Q. On average, Verizon had about 15 cable systems during this period, doing the math.

A. Verizon is known for having very large cable systems.

Q. And on average, Charter had more than

100 systems during this period, just dividing 3.9 million by 35,000?

A. That's correct.

Q. So Charter systems were much smaller, on average, than the Verizon systems?

A. Yes, that seems to be true.

Q. And according to your Figure 8, the average size of the Comcast, Time Warner, Cox, and AT&T cable systems were somewhere between the Charter and Verizon systems on average?

A. Yes, that's correct.

Q. And the other MSOs, the other column toward the right, on average had cable systems with fewer subscribers than the six that you just set out?

A. That's correct.

Q. All right. Well, that covers the size, but I want to talk about the complexity of the cable systems distant signals. And for the most part, the largest systems did not carry the same set of distant signals to all of its subscribers in their system; is that right?

A. Well, I don't know if that's right, actually. I mean, I didn't -- I didn't break down the -- this Figure 10 which shows the

number of subgroups by system size. So I don't know if that's true.

Q. Okay. Well, different subscriber groups within the same system received different sets of distant signals; right?

A. Yes.

Q. And -- well the Bortz survey and the Horowitz survey and the Israel regression, they stop at the level of the cable system as a whole and they don't go deeper; is that right?

MR. STEWART: Your Honor, I object again to further questions of this witness about the Bortz survey. He said that he hasn't studied it.

MR. CHO: You Honor, he's said that he is generally familiar. I don't know exactly how familiar he is. But my question is -- this is a pretty high-level question.

JUDGE BARNETT: This is not a specific question about the Bortz survey, but I agree with you, Mr. Stewart, that we don't need further questions on the specifics of the Bortz survey, since the witness has said he is not familiar with the details of it. But that question is acceptable. You may answer.

THE WITNESS: Thank you. Although I think I will divide up my answer. I am familiar that the Israel regression was at the system level; I think I knew that the Bortz survey was at the system level; but I'm not at all familiar with the Horowitz survey.

BY MR. CHO:

Q. Well, let's talk about what you did. You actually dug deeper and analyzed these subscriber groups within each system; is that right?

A. That's correct.

Q. And that detailed subscriber group data has actually never been available before or used in any prior proceeding -- or any prior regression previous to this proceeding; is that right?

A. There were two questions in there. So my understanding is that subscriber groups were available in previous proceedings. But I don't believe that they were used in previous regressions in previous proceedings.

Q. And the richness of your dataset allowed you to control for system level fixed effects, even within the same accounting

period; right?

A. That's correct.

Q. And because of your rich data, at the same time you were also able to provide more precise estimates with tighter confidence intervals than any previous regression in these proceedings; right?

A. Well, I mean, any previous regressions in these proceedings is fairly broad. So I'm familiar with the Waldfogel regression and my confidence intervals were tighter than the Waldfogel regression.

Q. Did you review the Ralston regression?

A. I reviewed it for the previous proceeding, but I did not review it for this proceeding.

Q. I see. So you didn't re-review it in preparing your testimony here?

A. Yes.

Q. Understood. But your regression has tighter confidence intervals than that regression, as well; is that right?

A. Yes -- oh, than that regression? I'm not sure. I reviewed it so long ago, I don't really remember.

Q. So according to the bottom of your Figure 10, there were some cable systems that had more than 20 different subscriber groups?

A. That's correct.

Q. Do you know whether larger cable systems, which accounted for more of the royalty payments -- that's what I mean by larger -- on average had more subscriber groups than smaller cable systems?

A. I don't know.

Q. Well, a different question; Mr. MacLean asked about the first row on this table. And is it true that on average the smaller systems that paid the least royalties fall into this category of having only one subscriber group?

A. So again, I don't know how this table correlated with the size of the system.

Q. Okay. Well, by my calculation, the largest 50 systems by royalty payments in the last accounting period of your study averaged more than 15 subscriber groups per period. Is that consistent with what you observed?

A. Well, I mean, I haven't observed it, but -- so I can't comment one way or the other

whether that is true.

Q. Well, one thing I do want to clear up from yesterday. Mr. MacLean yesterday suggested that a system paying a minimum fee would not have any reason to have multiple subscriber groups. But now that we clarified earlier this morning that the minimum fee actually only applies on a systemwide basis, as you consistently testified, isn't it actually the case that cable operators would have an incentive to use subscriber groups to pack all the communities that have the highest demand for distant signals into one subscriber group that receives maybe more than one DSE, and then put the rest in a subscriber group that gets fewer than one DSE in order to pay the minimum fee for the system as a whole?

A. So that's not my -- that's not how I usually think of how the cable operator would select the distant signals to carry in subscriber groups.

Q. I guess I'm just asking at a theoretical level, if a cable operator that is trying to reduce its cable fees might use subscriber groups to actually fall within the

minimum fee while importing distant signals? Is that possible?

A. Could you maybe elaborate a little bit more on the scenario you see?

Q. Sure. For example, a cable system might want to gerrymander its borders or create different subscriber groups within a system, so that maybe there is a section that's a major city that doesn't need to import a lot of distant signals and a more suburban or rural community all connected, and they have discretion to draw the borders of their cable system. And then they could have a subscriber group out there that gets two DSEs and the large subscriber group in the city that gets zero DSEs, and they end up paying the minimum fee?

A. I mean, that's possible. But I have no evidence for it.

Q. Mr. MacLean also asked you yesterday about -- about an implied coefficient for Big Three network nonduplicated network programming. Do you recall that?

A. I do.

Q. And I think you gave him three reasons

why -- why his interpretation of that, what he felt was an implied coefficient, is not really valid. And I'll restate, and you can correct me if I am wrong --

A. Do, please.

Q. I believe, one, you said that that variable actually wasn't significant. Two, it combined multiple things that were off-air minutes plus Big Three nonduplicated network minutes. So all those minutes were just combined in one variable. And third, it was an effects regression, and so you can't really interpret a variable that the effects regression wasn't designed to actually have an interpretable coefficient for; is that right?

A. So that sounds -- without looking at the specific transcript, that sounds broadly consistent with my testimony from yesterday.

Q. I just want to follow up on that last part about the effects regression being -- I think that there may be a reason why stations -- and I think you touched on this yesterday -- there is maybe a reason why stations that are importing nonduplicated Big Three network programming might be different from other

stations in the population; is that right?

A. You mean systems importing?

Q. Oh, I'm sorry, systems, yes.

A. Might be different from other systems in the population?

Q. Exactly. Or subscriber groups, I guess is the more relevant.

A. Yes, I could imagine that there are probably much smaller systems. If it is a system that is importing nonduplicated Big Three network programming, then presumably it doesn't have its own Big Three network programming locally. And to me, this suggests that they are probably small systems.

Q. In fact, there might be all sorts of what you would call unobserved heterogeneity or differences between subscriber groups that need to import a Big Three network station versus all of the other systems. And that, in fact, that omitted variable bias might be captured within this variable that Mr. MacLean was trying to interpret as just reflecting the value of Big Three nonduplicated network minutes?

A. So I disagree strongly with that

characterization. Shall I elaborate?

Q. Yes, please.

A. So I think if different systems or subscriber groups are importing different distant signals, they're doing so to reflect the value they have for the programming. That's not an omitted variable; that's an included variable. So they are selecting the distant stations to carry and the regression measures the value of the different minutes of programming. So it's not omitted.

Q. I didn't mean to say -- I was not saying this would bias the coefficients of interest for the minutes that you actually designed your regression to interpret. I'm sorry if I was unclear.

I was just saying if Mr. MacLean is trying to interpret the coefficient for -- you know, the implied coefficient that he created for a Big Three nonduplicated network minute, that variable is actually capturing potentially any differences that a system might have that decides that it needs to import a Big Three network; isn't that right?

A. Well, I dispute the value of the

premise for the reasons I gave Mr. MacLean yesterday --

Q. Right.

A. -- of investigating the consequences of this coefficient. So -- but putting that aside, if you could repeat again -- I wanted to get that out first -- and if you can repeat again your question, I am happy to consider, sort of pursue it even absent -- because of the first two considerations, to pursue investigations on the third.

Q. I guess what I'm really getting at is since you didn't design your regression to try and have an interpretable coefficient to measure the value of nonduplicated Big Three network programming, you didn't try and account for all of the control variables that would be needed to actually have an interpretable coefficient for that. And you wouldn't need to, because what you are trying to do is interpret the effects of these minutes of the six categories of programming, which do not include Big Three network programming.

A. So -- so I disagree with this. So, I mean, the purpose of the proceeding is to

measure the relative value of the Claimant categories. But it does show in my regression, as I described to Mr. MacLean yesterday, by including the total minutes that measures these relative to the value of -- in the nonduplicate analysis -- the pool of nonduplicated network programming and off-air programming.

And so, in fact, the regression does measure also the -- implicitly, the value of this pool of off-air and nonduplicated network programming.

Q. Exactly. That's what I was trying to get. Thank you. And I guess my point is, then, you don't need to worry about trying to have the regression as an interpretable Big Three network coefficient, because the purpose of that variable would be entirely different?

A. Well, I mean, the -- I mean, we don't use that coefficient in the actual royalty shares. But it's part of the calculation that goes into the calculation of the royalty shares for the other -- for the Claimant categories.

Q. Let's talk about another feature, the quality of your data. So some other studies in this proceedings, which will go unnamed, don't

try to survey every single cable system in every year. Those surveys rely on samples or the other studies rely on samples; is that right? The Bortz survey, you probably know, does rely on samples; right?

A. I am familiar enough with the Bortz survey to understand that it relies on samples.

Q. And each of those surveys actually involve fewer than 100 unique respondents; do you know?

A. I did not know that.

MR. MacLEAN: Objection. Outside the scope of Direct.

JUDGE BARNETT: Sustained. Although I think that objection belongs to the party presenting the witness.

(Laughter.)

MR. STEWART: I agree with Mr. McLean. That's the last time I'm going to say that.

(Laughter.)

MR. CHO: Your Honor, one of the key issues in this proceeding will be, you know, the extent to which Dr. Crawford's survey -- I mean Dr. Crawford's study corroborates or does not corroborate the Bortz survey. So I am

going to ask some questions, if I may, about the Bortz survey. But I can ask in a hypothetical, if he is not familiar with the details of the Bortz survey.

JUDGE BARNETT: You can ask about the results of the Bortz survey and, if he knows, he can answer. Otherwise, it would have to be a hypothetical question.

MR. CHO: Understood. Thank you.

BY MR. CHO:

Q. In the past, the regression analyses in these proceedings have relied on samples as well; is that right?

A. Samples is a broad term. So in some data in some settings, they relied on the population of the systems, but perhaps samples of the programming. So -- the answer varies depending on the variable that we are talking about.

Q. Well Dr. Waldfogel's regression we've seen relied on a sample of only three weeks of programming data from each accounting period; right?

A. That's my understanding for the programming data, yes.

Q. And unlike that study, your study did not rely on sampling; correct?

A. That's correct.

Q. In fact, you used the entire population of programming on all the distant signals for all four years?

A. That's correct.

Q. And unlike the sample-based survey, your regression is able to systematically account for all the programming that was transmitted to all the subscriber groups in the four-year period?

A. That's correct.

Q. So it's actually impossible for your study to suffer from a bias like nonresponse bias?

A. The word "nonresponse bias" would not be relevant for the environment that my study applies.

Q. Right. Because your study actually captures all of that data. You are not surveying anyone. There is no respondent.

A. Exactly. There is no respondent.

Q. And another feature of your study is that you actually are able to take into account

non-compensable programming; right?

A. Yes.

Q. In fact, your regression is able to fully control for non-compensable programming and doesn't attribute any value to that non-compensable programming for any Claimant group; right?

A. You misstated a little bit. So in the regression, if the non-compensable programming has a value to the cable operator, then it informs the regression coefficient. But then, once I have the regression coefficients, of course. I only apply them to the compensable programming.

Q. My question, I believe I said, was you don't attribute any value to the non-compensable programming for any Claimant group?

A. That I agree with. I didn't know that the previous question said exactly that.

Q. In your report you offer two different versions of your regression analysis; right?

A. That's correct.

Q. Your initial analysis and then what you called the nonduplicate analysis?

A. That's right.

Q. In your nonduplicate minutes analysis you removed all of the value for all duplicated programming; right?

A. I mean, I reviewed -- I removed from the data duplicated network programming.

Q. When you say "duplicated network programming," you're not restricting that to the Big Three networks though. You actually included all types of programming from --

A. From networks. That's correct. It wasn't just the Big Three networks. As I mentioned in my Direct Testimony, Fox was included, PBS, Univision, et cetera.

Q. And the only basis for your decision to remove 100 percent of the value for duplicated minutes is your intuition that duplicated programming had zero value for cable system operators?

A. So let me -- I'm going to contest the premise and then ask you to ask the question again, because I think you mischaracterized. When I remove the duplicated minutes -- so the minutes of duplicated programming, so the way I think about it is that the minutes of that

duplicated programming has no value to cable operators.

When I include it in the initial analysis, then I'm basically measuring an average value of programming which includes the value of nonduplicated programming, the positive value for nonduplicated programming and a zero value for the duplicated programming.

When I then remove the duplicated programming, of course you are only left over with the nonduplicated programming that has positive value. So, of course, the value per minute of that programming comes higher because we are no longer averaging in a bunch of zeros.

So I don't take away any of the value of the programming, because I take away -- so the programming that remains has higher value because it's not being averaged with a bunch of zeros. So there is no removal of the value of the programming from any Claimant category.

Q. Well, let me ask my question again --

A. Please.

Q. -- and see if you are able to respond. The only basis for your decision to remove

100 percent of the value from the duplicated minutes is your intuition that the duplicated programming has zero value to cable operators?

A. I don't remove 100 percent of the value from duplicated minutes. So -- oh -- I -- I -- the premise behind the analysis is that the duplicated minutes have no value. So -- but putting aside that disagreement with the beginning of your question, I am happy to answer the second half of your question, which is that because of this idea that duplicated programming is a perfect substitute for existing programming and it, therefore, would have no value to the cable operator, and so I guess my justification for this is that it's a bit of an extension of the network nonduplication rules to networks outside the Big Three. So it basically captures this idea that programming on networks that duplicates programming that is already in the local market has no value to the cable operator.

Q. Well, does the network non-duplication rule imply that the cable operators do not value duplicated network programming?

A. My understanding of the rules is that

the local station that has exclusive rights to the programming can ask the cable operator to blackout that programming. And if it's blacked out programming, I assume it has no value. In fact, it may even have negative value.

Q. But the rule, actually, doesn't -- isn't derived from cable operators' preferences or their valuation. It's a rule; right?

A. It's a rule. And I'm not even deeply familiar with the specific rationale for the rule. But from an economist perspective, when I see the rule and say why does that rule make sense, I think it is meant to protect local broadcasters that have an exclusive right to programming to have the identical programming present on another signal and, since it is a perfect substitute, some consumers might otherwise go to that signal. And so they -- because they are perfect substitutes and so then it is blacked out.

Q. But is it your opinion that that rule is, in fact, a reflection that that cable operators do not value the distant duplicated network programming?

A. From a cable operator's perspective,

they want to have a program for the consumers; right? And so once they have it on one signal, what is the point of having it on another signal?

Q. And the rule, in fact, doesn't apply to any networks other than the Big Three networks?

A. That's my understanding.

Q. Have you ever discussed with any cable operator whether or not duplicates have any value?

A. I have not.

Q. And you don't cite any literature or evidence beyond that intuition?

A. No, I don't.

Q. In fact, is it possible that cable subscribers develop brand loyalty to a particular station and like to continue to watch the same channel, both for its unique programming as well as its network programming?

A. I mean, I do believe stations potentially develop brand loyalty in general, yes.

Q. And do you think it's possible that some viewers might want to continue to watch

the same channel that they consistently watch?

A. But I think the viewing of distant signals is so tiny, relative to the viewing of local stations, that I think -- I can imagine the idea of brand loyalty for a local station, but I think the concept, while relevant for what might be large stations within a market, is probably less relevant for these smaller distant signals.

Q. And the only basis for that is your intuition?

A. My analysis of the likely forces within the market.

Q. But there's no -- you can't point to any evidence?

A. That's correct.

Q. So to the extent that there may be some value to network programming brand loyalty, whatever it might be, would you agree that if you were imposing that all Public Television programming has -- duplicated Public Television programming has zero value, that the implied share for Public Television in your nonduplicate minutes analysis is conservative as to Public Television?

A. No -- no, because if you recall, by taking out those minutes -- suppose for the minute -- suppose I agreed with your premise that those minutes didn't have zero value, but some slight nonzero value. In the -- by virtue of taking them out, I measure a higher value -- so and let's continue the premise that the value to cable operators of nonduplicate PTV programming is higher than whatever this slight value.

Then by virtue of taking out the duplicate programming, what I am estimating is this higher value of the other minutes. And so it would be absolutely inappropriate to apply that higher value, which was estimated on data associated with nonduplicate programming, and then applying it to the programming minutes I dropped in the duplicate analysis. That would be a mistake.

Q. I very much agree with you. But my question is really that if you -- if there were some value, as you were saying in this hypothetical, if there was some value to Public Television duplicated minutes that is slightly above zero, at least, then the shares that you

compute in your duplicate analysis would be conservative as to Public Television. We can see that between your initial analysis and the Public Television analysis there is a gap.

A. There is a gap in -- so let me say the initial analysis didn't drop the duplicate minutes. And so the initial analysis would capture whatever is this value of both the duplicate and nonduplicate minutes. But it did not need to -- none of the coefficients needed to go any particular direction once one takes away the duplicate minutes.

So it just -- it happened -- because what is happening when you take away the duplicate minutes you get a higher average value per minutes. And then for some program categories, fewer minutes. So one number goes up and one number goes down, and it could have been higher or lower than the share estimate from the initial analysis.

Q. But isn't it true that if there were some value to those duplicated minutes, then the shares would fall somewhere in between the initial analysis and the nonduplicated minutes analysis?

A. No, if there was some value, then the results of the initial analysis would be the germane results, because the initial analysis includes those minutes.

Q. Now, I want to turn to looking at the shares that you actually propose in your nonduplicate minutes analysis which are on Figure 20 of page 45.

A. Okay.

Q. What are the numbers in the parentheses?

A. The numbers in the parentheses are an estimate of the standard error for the estimates.

Q. So to calculate a 95 percent confidence interval for each of these point estimates, you can multiply the standard error by roughly two, and then add or subtract them to each point estimate to get a confidence interval?

A. That's true. That is how one gets confidence intervals, in general.

Q. And you note that in Footnote 60. All right.

A. Good.

Q. Now, I imagine that this may be fairly sample arithmetic, but I will hand you a calculator, if you would like, so you can use it.

MR. CHO: May I approach the witness?

JUDGE BARNETT: Yes.

BY MR. CHO:

Q. Just to take an example, if you wanted to calculate the confidence interval for 2010, that first row, for Public Television, your point estimate is 14 percent and the standard error is 1 percentage point. So double it, it is 2. So 2 is the 95 percent confidence interval, plus or minus 2 percentage points; is that right?

A. That's correct.

Q. So if you subtract 2 from 14 you get 12; you add 2 to 14, you get 16. So the low end of the 95 percent confidence interval for Public Television would be 12 percent and the high end would be 16 percent?

A. That's correct.

Q. So if we go to the next slide, I have done that arithmetic in the table. And I'm not going to ask you to verify all of that right

now, but this slide is demonstrative. But is this approach I described consistent with how you would calculate 95 percent confidence intervals?

A. It is, yes.

Q. In your rebuttal testimony, Exhibit 2005, on page 19, you point out that Dr. Gray's study must not actually reveal relative values to CSOs because his estimated shares were different from yours; right?

A. Well, that was -- I had many objections to Dr. Gray's study. But one of the objections was that if his did reveal relative value, they should broadly corroborate my study, which I do believe reveals relative value.

Q. All right. On the next slide, I've added the Bortz survey shares from page 3 of Exhibit 1001.

MR. CHO: May I approach the witness?

JUDGE BARNETT: You may.

THE WITNESS: Thank you.

BY MR. CHO:

Q. And on this demonstrative, if the Bortz survey share was outside of the

95 percent confidence intervals, I've marked it in red. And just looking at -- and if you want to look at the Bortz estimates, it's on page 3 of 1001.

And just looking at the Public Television column, in every year the Bortz estimates for Public Television are outside of the 95 percent confidence intervals produced by your regression; right?

A. There are a lot of numbers here, but I think, yes, that's right.

Q. And, in fact, for the entire 2010 to 2013 period, the Bortz estimate for Public Television is 5.1 percent. And how many standard errors is that below your regression's estimate for Public Television? We can do the math together, if you like. So your point estimate, I believe, was 17.02.

A. Okay.

Q. And the Bortz survey share for the entire four-year period is 5.1 for Public Television. So that is a difference of 11.92, if my subtraction is correct.

A. Okay.

Q. And you would just divide 11.92 by

your standard error, 1.23, and according to my math, that is 9.69 standard errors.

A. That sounds correct. Although I would point out that, of course, both my estimates, and I presume the Bortz estimates, are estimates. And so I presume Bortz also has standard errors.

Q. Yes, it has confidence intervals. I think his Public Television confidence interval is purportedly half a percentage point, according to Mr. Trautman.

But if you were to adjust the Bortz estimate to include systems that carry only Public Television, per another witness' testimony, Public Television's share would go to about 8 percent. So in a hypothetical world where Public Television's share is about 8 percent in a different study, would that still be more than 7 standard errors below your regression's estimate for Public Television?

A. Yes, a share of 8 percent would be something on the order of 7 standard errors below my estimate for Public Television.

Q. Now, when you are interpreting standard errors -- 7 standard errors, that

would be on the lower bound on what I believe would be a 99.9999999997 percent confidence interval. Does that sound roughly right?

A. That sounds approximately right.

Q. Would you also agree with me that in every year the Bortz estimate for Program Suppliers are outside of the 95 percent confidence interval produced by your regression analysis?

A. Yes, it looks like it.

Q. So, for example, in 2011 the Bortz estimate for Program Suppliers is more than 6 standard errors higher than the estimate produced by your regression?

A. I mean, we could do the math, but I trust that you have done the math correctly.

Q. Thank you. Incidentally, are you aware of any reason why the Bortz survey would have estimated Program Suppliers' value in 2011 to be so much higher than 2010 or '12 or '13?

A. As I said earlier --

MR. STEWART: Objection.

JUDGE BARNETT: Sustained.

BY MR. CHO:

Q. Are you aware -- setting aside the

Bortz survey, are you aware of any reason Program Suppliers' value might be, in 2011, so much higher than 2010, '12 or '13?

A. I'm sorry; I missed that question. Say that again, please.

Q. Are you aware of any reason why Program Suppliers' share, relative market value share, in 2011 should be so much higher than in 2010 or '12 or '13?

A. I mean, I can only report what my study shows. And, I mean, I don't have the point estimates in front of me, but -- I mean, they go down a little bit over time. I mean, I could look at my --

Q. Feel free.

A. Okay. I think I will. So I show sort of a general decline in the Program Suppliers' share over time in my recommended royalty shares.

Q. In fact, it's a consistent decline.

A. A continuous decline.

Q. Now, the Bortz estimates for Devotional programming are also significantly above your regression's 95 percent confidence interval in every year; is that right?

A. That's true.

Q. And the Bortz estimates for Canadian programming are significantly below your regression's 95 percent confidence interval in every year?

A. That's true.

Q. That leaves Commercial Television and Joint Sports. In two of the four years, the Commercial Television's Bortz estimates are within your regression's 95 percent confidence interval; is that right?

A. Yes, that's correct.

Q. But in the other two years, the Commercial Television's Bortz estimates are outside your regression's 95 percent confidence interval?

A. Outside, but fairly close.

Q. Fairly close. And for the Joint Sports Claimants, their Bortz estimates are within your 95 percent confidence interval in every year?

A. That's true.

Q. Is it fair to say that there are statistically significant differences between the Bortz survey shares and the shares

estimated by your regression analysis?

MR. STEWART: Objection. Your Honor, the witness has already indicated that he believes that there must be standard errors around the Bortz results and any questions about the statistical difference would be difficult.

JUDGE BARNETT: Sustained.

MR. CHO: You Honor, may I direct him to the confidence intervals in the Bortz surveys so that he may look at those?

JUDGE BARNETT: You may do that.

BY MR. CHO:

Q. I believe they are in the appendix -- one of appendices to 1001. Yes, it's toward the very back on the last five pages. On page D8 through D11 of Exhibit 1001, Mr. Trautman reports confidence intervals.

A. So it's just the first table on each of the pages?

Q. Yes, that is correct.

A. Okay. So repeat your question.

Q. So with that additional data, are you able to answer whether it is fair to say that there are statistically significant differences

between the Bortz survey shares and the shares estimated by your regression analysis?

A. Can we come back to your table?

Q. Yes.

A. So it's -- so -- so I'm able to make -- with my own analysis, I'm able to do any hypothesis tests with respect to any single number within my data. So if you ask me is a particular number 9 standard errors below my point estimate, I can say that.

When it involves comparing results across studies using different datasets and different techniques, it's not as comparable. So I'm completely comfortable answering any question, does any number lie within or outside or relative to my confidence intervals. But in terms of assessing whether -- that's the limit of my comfort of what I am able to answer.

Q. Are you able to answer, just taking this set of Bortz point estimates as a, you know, hypothetical, are you able to answer whether or not that set of numbers is statistically significantly different from your regression analysis?

A. So the midpoint of the Bortz

estimates, as you report on your table in front of me, is, depending on year-end category, outside the confidence intervals that I have for my study.

Q. Setting aside the statistically significant issue for a second, is it fair to say that there are economically meaningful differences between the Bortz survey shares and the shares estimated by your regression analysis, just assuming that these numbers are the Bortz survey shares?

MR. STEWART: Objection as to the use of the term "economically meaningful."

MR. CHO: The question is in within the witness' experience, if he believes they are, in his opinion, economically meaningful.

JUDGE BARNETT: That is sustained. That's very fuzzy. If you can break it down and ask it another way, Mr. Cho, have at it.

BY MR. CHO:

Q. Sure. So if you have an incredibly large dataset -- for example I have done analyses on voter registration datasets -- you can get pretty much any variable that is statistically significant, even if you wouldn't

think there was any theoretical reason to have that data to be meaningfully different under a particular variable. If you have a big enough dataset, you can find statistical significance. But that doesn't mean that it is important in an economical or theoretical sense.

But the number could be -- it could be because the coefficient could be very tiny or very small. But when you have a big number difference, that could be economically meaningful, even if it is not statistically significant; right?

So what I'm trying to get at is there could be a difference between statistical significance and economic significance; is that right?

MR. MacLEAN: Objection.

MR. STEWART: I also have an objection, your Honor.

JUDGE BARNETT: Mr. MacLean?

MR. MacLEAN: Objection. He incorporated the same term as in the last objection to the question. But my objection is that counsel is testifying.

JUDGE BARNETT: Mr. Stewart?

MR. STEWART: And my objection is that this purports to be a question about the potential economic significance of the Bortz survey results, as to which Dr. Crawford has testified he hasn't studied the study itself.

MR. CHO: Your Honor, I'm not asking him to assess the Bortz survey. I'm just asking whether these numbers, taken hypothetically, are economically different or different in a meaningful way. And I'm going to try and develop that idea so that he can answer in whatever way he thinks is appropriate in his opinion.

JUDGE BARNETT: I think he answered the question with regard to statistical significance.

MR. CHO: Yes. And I'm trying to ask him about a different concept.

JUDGE BARNETT: Well, that's the concept we're all having trouble with. I'm going to defer to our Judge with the significant economic knowledge and see if he is familiar with the term and comfortable with the question and the answer.

JUDGE STRICKLER: Well, are you asking

about the economic significance as distinguished from the statistical significance?

MR. CHO: Exactly.

JUDGE STRICKLER: Why don't you ask the witness if he understands what you mean by economic significance in this context, as contrasted from statistical significance?

BY MR. CHO:

Q. Do you understand the difference between economic significance in this context as opposed to statistical significance?

A. To be honest, I don't.

(Laughter.)

JUDGE BARNETT: Sustained.

(Laughter.)

BY MR. CHO:

Q. In your testimony, you concluded that the best method for estimating relative marketplace value is regression analysis; is that right?

A. I mean, in my testimony I said that there are several appropriate methods and regression is the one I used.

MR. CHO: If you could put up the

slide.

THE WITNESS: Okay.

BY MR. CHO:

Q. I believe this is page 3 of your testimony. I think you concluded that the best method for recovering relative marketplace values is to apply a regression approach using outcomes from the existing market; is that right?

A. Yes, that's right.

Q. Thank you. I pass the witness.

JUDGE BARNETT: When I asked about cross-examination yesterday, there was very little response, although everyone did have an opportunity, I think. Is there anyone else who has questions for the witness, before Mr. Stewart has redirect? Okay.

Mr. Stewart.

REDIRECT EXAMINATION

BY MR. STEWART:

Q. Good morning, Dr. Crawford.

A. Good morning.

Q. It's been a long time. I just had a few questions for you.

First, with respect to the questions

that Mr. Cho just asked you with regard to niche -- your testimony in a prior proceeding about niche networks. Do you recall that?

A. I do.

Q. And I'm sorry that I don't remember the number of the exhibit that we're discussing, but he referred you to your prior rebuttal testimony; correct?

A. That's correct.

Q. Do you have that in front of you?

A. I can pull it out again. I have it.

Q. And you cite in Footnote 24 on page 10 of that the examples from which you drew the characterization of Public Television as a niche network; is that correct?

A. That's correct.

Q. What was the comparable cable network that you referred to?

A. C-SPAN.

Q. All right. And in this proceeding, your testimony does not identify -- has not identified PTV as a niche program service; is that correct?

A. That's correct.

Q. Is that consistent with the results of

your regression? That is, does it have different coefficients?

A. Yes.

Q. And describe -- I'm sorry --

A. I should be -- different coefficients relative to?

Q. To other -- to other program categories that you've identified as niche programming.

A. Clearly, yes.

Q. Now, yesterday Mr. MacLean showed you, among other drawings -- and I'm sorry I'm not going to be able to do the same -- one that appears to be an X with royalties on the left axis and apparently some minutes of programming, or some similar thing, with respect to CTV programming and Devotional programming. Do you recall that?

A. I do.

Q. And for CTV, he had a black line that started in the lower left and increased to the right?

A. That's right.

Q. And for Devotional programming, he had a line that started in the upper left as red

and went down to the lower right; is that correct?

A. I do remember.

Q. And that slope would indicate a negative coefficient; correct?

A. That's correct.

Q. But your study did not provide a negative coefficient for Devotional programming, did it?

A. It did not.

Q. So what is the meaning of a positive coefficient in this context?

A. A positive coefficient in this context means that the relative CSO value for programming, in this case Devotional programming, would be positive.

Q. So that more minutes of Devotional programming is associated with increased royalties; is that right?

A. I'm sorry; yes, that would be a clearer way to say the same thing.

JUDGE STRICKLER: Are you referring to the drawing that Mr. MacLean did where he had cost as a percent of income?

THE WITNESS: It was -- it was one

after this, I believe. That one was with beef and lettuce and this one that Mr. Stewart is referring to was with CTV and Devotional.

JUDGE STRICKLER: Okay.

BY MR. STEWART:

Q. Now, he also talked to you about your use of log royalties as the dependent variable; is that correct?

A. That's correct.

Q. He talked about how two different cable systems, one with a thousand subscribers and one with 100,000 subscribers -- do you recall that?

A. I do.

Q. And a 10 percent increase in the royalties would be associated in the two cases with a thousand subscribers in the large system but only ten in the small system -- no?

A. One hundred.

Q. One hundred in the small system. So if you had used a linear royalty measure, that 10 percent increase in both systems, would it have produced the same effective relationship for your regression purposes?

A. I don't -- so if my dependent variable

had just been royalties?

Q. Yes.

A. Would it have produced the --

Q. Would it have produced a different result in effect, or a different effect measured for the two different systems, each of which had a 10 percent increase?

A. No, it would have been the same thing.

Q. Would it not have produced an increase of a thousand in the 100,000 subscriber network?

A. Oh, I'm sorry; if that same parameter had been with a linear regression, yes, it would have produced the same linear effect for both.

Q. So the impact would have been measured at 100 times more for the large system than the small system?

A. That's correct.

Q. So why did you include -- is that related to why you include the log form of the royalties?

A. Yes.

Q. How so?

A. Because as I mentioned, especially

when it came to the minutes of programming, I thought it important to capture this idea that there is more likely to be a proportional effect on royalties of linear changes in variables than a linear effect.

Q. And Mr. MacLean also talked to you about the level shift issue. Do you recall that?

A. I do.

Q. And the numbers that he picked for his hypothetical showed a 50 percent increase in the Devotional coefficient and a 5 percent increase in the CTV coefficient; is that correct?

A. Something like this, yes.

Q. Now, if the actual numbers turned out to be substantially smaller, orders of magnitude smaller, would there be any disproportionate any significant disproportionate impact across the coefficient of these different categories.

MR. MacLEAN: I object to "significant" in this context.

MR. STEWART: I will reword it.

JUDGE BARNETT: Thank you.

BY MR. STEWART:

Q. So, for example, if instead of a .05, if I recall his hypothetical correctly, or .00005 level shift, would there be large differences in the relative sizes of the coefficient?

A. No.

Q. And could we look at Figures 19 and 20 of your Direct Testimony. Let's look at Figure 19. Can you blow that up for me?

Your response to Mr. MacLean included a reference to the fact that other things are changing as you would add a level shift across the categories; is that right?

A. That's correct.

Q. So if you look at the bottom line here, the Devotional -- the average marginal value of Devotional minutes is .032. Do you see that?

A. I do.

Q. Now, comparable orders of magnitude, although the numbers are slightly larger, are Program Suppliers at .69 and Public Television at .054. Do you see that?

A. Yes, that's correct.

Q. So a level shift would have a similar order of magnitude of effect on those average marginal values as it would for the Devotionals; is that correct?

A. Broadly, yes.

Q. Now let's look at Figure 20. You see in the bottom line comparing the implied share for Devotional programming against the implied shares for Program Suppliers and Public Television, there is quite a large difference; is that right?

A. That's correct.

Q. And that's attributable to the amount of programming in those other categories that is in the mix; is that right?

A. That's correct.

Q. So if you had this level of shift that had even the kind of disproportionate impact that Mr. MacLean's hypothetical showed, would you necessarily expect to see a significant increase in the relative increase in the Devotional implied share?

A. No.

Q. Mr. MacLean talked to you at some length about implying a variable for

nonduplicated network minutes. Do you recall that?

A. I do.

Q. There was some Greek and some algebra involved, as I recall. So first, your study defines nonduplicated Big Three network minutes as those minutes that are not -- as including programs that were not aired simultaneously with local versions or other distant signal versions of the same programming; is that correct?

A. That's correct.

Q. Now, I'm not going to test you on the law, but if the law were -- if the FCC's network non-duplication rule were that all programming from Big 3 networks was to be blacked out at the request of a local authority of the same network by cable systems, regardless of whether they aired at exactly the same time, would that lead you to expect a large or small -- or what would that lead you to expect about the likely value of this, quote-unquote, network nonduplicated programming?

A. I would think it would not be very

important.

Q. I'm not entirely clear on this, but I want to make sure that the record is clear. In discussing something with Mr. MacLean, I believe he referred to your definition of the hypothetical market, or your description of your view of the hypothetical market, and he suggested, if my memory is correct, that such a hypothetical market would include a minimum fee. Do you remember that testimony or do you remember that question?

A. I don't remember that specific question.

Q. Just to be clear, in your view of what the hypothetical market would be, would there be a minimum fee?

A. No.

MR. STEWART: I have no further questions.

JUDGE BARNETT: Okay. Thank you. Professor Crawford, you may be excused.

THE WITNESS: Thank you.

MR. STEWART: Your Honor, our next witness is on her way here from her hotel. So if we could have the morning break, that would

be great.

JUDGE BARNETT: We will be happy to do that. 15-minute recess.

(A recess was taken at 10:21 a.m., after which the trial resumed at 10:50 a.m.)

JUDGE BARNETT: Raise your right hand.

Whereupon,

CERIL SHAGRIN

was called as a witness and, having been first duly sworn, was examined and testified as follows:

JUDGE BARNETT: You may be seated.

DIRECT EXAMINATION

BY MR. STEWART:

Q. Please state your name.

A. Ceril Shagrin.

Q. Could you pull the mic a little closer to you.

A. Absolutely.

Q. Ms. Shagrin, what is your current occupation?

A. I'm a consultant for, primarily, Univision.

Q. And before becoming a consultant, where did you work?

A. I worked at Univision for over

17 years, and I worked for Nielsen for about 27 years.

Q. So Nielsen was prior to Univision; is that right?

A. Yes.

Q. What work did you do while you were at Univision?

A. I organized their Research department, and I was involved in analysis of Nielsen research and designing research for learning more insights into our viewers and our customers.

MR. STEWART: Is that mic on, actually?

THE WITNESS: Is this better?

MR. STEWART: Yes.

THE WITNESS: Thank you.

BY MR. STEWART:

Q. So how long you were at Nielsen?

A. 27 years.

Q. And what were your positions at Nielsen?

A. I started in their Inspection department, where I tested all of the computer programs to make sure that the data that we

were releasing was accurate. And I left there as a Senior Vice President in Market Development and Innovation.

Q. Did you work while you were at Nielsen on developing sampling approaches to better measure minority populations, including Hispanic households?

A. I did.

Q. How did you do that work? What was that work?

A. With the Hispanic households, the Spanish networks wanted to be measured with equal quality as Non-Hispanic. So in order to do that, I had to learn the differences within a Hispanic household and a non-Hispanic household and what were the key differences within that universe. I developed the concept of language differences and language weighting, which is used today.

Q. Now, Ms. Shagrin, have you also participated in industry groups that are focused on the quality of audience measurements?

A. Yes, I have. I have been a very active member of the Media Rating Council,

where all of the materials that we use in the services that the industry uses are audited to make sure that the data are being -- the work is being done correctly.

I also chaired the Council for Research Excellence for five years and was a participating member of that council from its development to now when it is leaving.

Q. And what does the Council for Research Excellence focus on?

A. The Council for Research Excellence focuses on methodology issues, both in terms of changes that are coming, digital, et cetera, and current, and how the world changes and people consume broadcasts and is constantly trying to stay ahead of it to know what has to be done to measure it accurately.

Q. Did you also participate in an organization called COLCAM, for short?

A. I was an active member of COLCAM for about five or six years, and I turned my position over to someone else at Univision who was in charge of local measurement, so that she would have an opportunity to grow.

Q. So what, in general, does COLCAM focus

on?

A. COLCAM focuses on local measurement, not on national at all, unless it needs to know the differences. But anything related to COLCAM -- to local measurement, COLCAM looks into.

Q. And have you been asked to testify before Congress about issues relating to audience measurement?

A. I have, twice.

Q. Could you describe those for me.

A. Once, when Nielsen rolled out Local People Meters and we at Univision felt that the sample was not representative. Congress apparently agreed that it was not representative and the outcome of those hearings was the birth of CRE, the Council for Research Excellence.

I did a similar thing with Arbitron's Portable People Meter. I testified in Congress and I was one of three people that monitored the differences that Arbitron made to address the problems that we had identified.

Q. Arbitron was providing radio ratings; is that right?

A. Yes, they were.
Q. Using that new meter technology; is that correct?
A. Yes.
Q. Ms. Shagrin, you are a recipient of the Hugh Malcolm Beville Award?
A. Yes, I am.
Q. What is that award?
A. That is an award that is given by the broadcast industry to a person that they determine has made a significant contribution to broadcast measurement.
Q. And all told, how many years have you worked in audience measurement, the audience measurement field?
A. 45 years.
MR. STEWART: Your Honor, I proffer Ms. Shagrin as an expert in television audience measurement.
JUDGE BARNETT: Hearing no objection, Ms. Shagrin is so qualified.
MR. STEWART: Thank you.
BY MR. STEWART:
Q. So you were asked by the Commercial Television claimants in this proceeding to

review and evaluate the viewing study that was presented by Dr. Jeffery Gray?

A. Yes, I was.

Q. And did you provide a written statement reporting your analysis?

A. Yes, I did.

Q. I put in front of you a copy of what's previously been admitted into evidence as Exhibit 2009. Do you see that?

A. Yes, I do.

Q. Is this your written statement?

A. Yes, it is.

Q. Do you have any corrections?

A. No, I do not.

Q. Okay. So first, let's talk about Nielsen, in general. Does the broadcast television industry rely on Nielsen data?

A. Yes, they do. It is the currency.

Q. And what particular kinds of data -- Nielsen data does the television market use?

A. Primarily ratings or projections from the ratings, that shows who is watching, how much they are watching, what else they do watch.

Q. And could you just define what a

rating is?

A. A rating is a percentage -- for national, I'm sorry, for national, the rating is a percentage of persons who are watching a particular time or program and it is an average minute audience.

Q. So that's a percentage of all of the television households in the U.S.; is that correct?

A. Based on a well-designed sample.

Q. And roughly how many television households are there in the United States? Do you know? It changes, I guess.

A. I don't want to guess.

Q. That's fine. Do national advertising markets and local advertising markets use different Nielsen ratings measures?

A. They do use different measures for national. What they look at is average minutes. For local, it is a different measurement, similar methodologies in some markets, and it is an average quarter hour. So anyone who watches at least five minutes within the quarter hour is credited with the entire quarter hour.

Q. Now, Ms. Shagrin, would it be fair to say that you have spent your career working to make sure that Nielsen data that are going to be relied on in the marketplace are valid, reliable, and properly measure minority populations?

A. I spent 45 years doing that and I think I will be doing that forever, as long as I'm around.

Q. I hope so. And what is meant by "valid"?

A. Valid means it's accurate. It means it's usable. It means it's done based on good research.

Q. And what is meant by "reliable"?

A. Reliable means that you don't change it, that you're using the same rules and the same processes and methodology so that changes in audience are real changes and not changes in methodology.

Q. Okay. Let's turn to Dr. Gray's study. Do you understand that Dr. Gray was attempting to measure the relative amounts of viewing of various programs on distant signals in cable households?

A. Yes, that's what he was attempting.
Q. And Dr. Gray used viewing from the National People Meter sample; is that correct?
A. Yes, it is.
Q. Do you understand that in reporting his final reports, Dr. Gray replaced all of the reported Nielsen viewing numbers with projections that he estimated based on his own regression analysis?
A. That is my understanding from his testimony.
Q. And in all of your years of experience in the media and audience measurements fields, have you ever heard of anyone in the marketplace relying on projected viewing numbers that were substituted for actual Nielsen numbers?
A. Never.
Q. Now, let's first look at sampling questions. Is the design and selection of a sample important to the validity and reliability of a viewing measurement?
A. It's the only way you can get reliable and valid data.
Q. And is Nielsen's National People Meter

sample a good sample?

A. Yes, it is.

Q. What was it designed for?

A. It was designed to measure network audiences, national audiences, whether it was cable or syndication or network.

Q. Nationally distributed?

A. Nationally distributed. Thank you.

Q. Now, if you were trying to measure -- setting out to measure viewing to programs on distant signals in cable households, what would be the first steps you would take to try and design that sample?

A. I would do my research so that I understood exactly what it was and so that I understood how you had to measure it in order for it to be reliable.

Q. So I'd ask you to turn to Exhibit A that is attached to your testimony, and let's look at it on the screen.

Now first of all, do you see that?

A. Yes.

Q. First of all, did you prepare these Exhibit A, B, and C charts that are attached to your testimony?

A. I did not.
Q. They were prepared for you?
A. By Dr. Bennett.
Q. Okay. And so what is your understanding of what Exhibit A shows?
A. What Exhibit A shows is that the smaller the market the greater the likelihood that they will be viewing to a distant signal, primarily because in a small market there are fewer choices.
Q. And let's turn to Exhibit B. And what is your understanding of what this exhibit shows?
A. It confirms what I saw from Exhibit A, which, again, is that the smaller the market, the greater the likelihood that someone will be picking up distant signals.
Q. And this particular chart on the bottom, it's the number of local stations; is that correct?
A. Yes.
Q. And so in general, the number of local stations is correlated with the size of the market; is that correct?
A. Yes, it is.

Q. Now, do these two exhibits provide information related to the first step you talked about doing your research for constructing a proper sample to measure distant signal program viewing?

A. They confirm the need to do that in order to understand the impact.

Q. And in particular, what sampling techniques might you apply, given the patterns of distant signals to market size?

A. I would start out by oversampling small markets. I would do my research to make sure that there weren't other things that I needed to be aware of and separately sample. But I would know from looking at just these two graphs that it was critically important to oversample the small markets so that I could get a real read of what was different in a small market and a large market.

Q. With respect to distant signals?

A. With respect to distant signals.

Q. And would you turn please to Exhibit C. And can you describe your understanding of what this graph shows?

A. Well, this graph actually helps to

verify the difference between a large market and a small market. Because where you have a large market, and there are 15 choices of what you could watch, you don't need to look for anything else. When you have a small market, it only has maybe four stations they can reach normally, the need and the desire to go to distant signals is increased.

Q. Okay. Now, so you talked about how you would seek to oversample small markets where the distant signals are. Does the National People Meter sample oversample small markets?

A. The National People Meter does not oversample small markets.

Q. And -- sorry. Go ahead.

A. The sample for the National People Meter is based on population in each market.

Q. So the largest markets have the most meters; is that correct?

A. Yes, that is correct.

Q. Now, in your opinion, can the NPM sample be used in its current form to produce a proper measure of distant signal viewing?

A. I do not believe it could.

Q. Now, I'll ask you to turn to page 9 of your testimony of Exhibit 2009. And here there is a section headed Weighting Problems. Now, does Nielsen -- I'm sorry; are you there?

A. I'm not there. I'm sorry.

Q. Okay.

A. Now I'm on page 9. Thank you.

Q. First, does Nielsen apply weighting to the viewing data that it collects from the NPM sample households as part of its NPM national ratings reports?

A. Nielsen uses a national sample for its national rating reports.

Q. And does it apply weights to the household data?

A. It does apply weights to the household data, primarily to make sure that it is representative of types of households and persons.

Q. And do you happen to know whether the weighting criteria includes a criterion for whether the household receives distant signals on a cable system?

A. It is not part of the weighting procedures today.

Q. And weighting is important; is that correct?

A. It's critical.

Q. So do you understand that Dr. Gray used only unweighted Nielsen household data in his viewing study?

A. That is what he did.

Q. And do you have an opinion about whether that would produce a valid or reliable representation of viewing -- of the viewing that he collected?

A. I am certain it would not be reliable, if it was done without weighting.

Q. And then finally, based on your experience and expertise, and on reviewing Dr. Gray's testimony describing his study, do you have an opinion as to whether Dr. Gray's study provides valid or reliable measures of actual viewing of programs on cable distant signals from 2010 to 2013?

A. I am certain that it does not.

Q. Thank you.

MR. STEWART: No further questions at this time.

JUDGE BARNETT: Cross-examination?

CROSS-EXAMINATION

BY MR. OLANIRAN:

Q. Good morning, Ms. Shagrin. My name is Greg Olaniran. I represent the Program Suppliers.

A. Good morning.

Q. What year did you leave Nielsen?

A. 18 years ago. I'd have to go back, I think it was 2000 -- 1999 or 2000.

Q. Okay. Thank you. And while you were at Nielsen, would you have had an opportunity to work at all on some of the major data collection techniques that happened while you were there?

A. I was involved in all of them.

Q. Okay. So you worked on development of the diaries?

A. The diaries, local market measurement, national measurement, People Meter.

Q. And what kind of work did you do on the diaries?

A. I examined the diaries to see how we could get better response rate. I would look at ways we tested. Would giving more money, less money, provide better return rates? When

I started, the diaries were fine. By the time I left, the diaries were not really a good data collection methodology.

Q. Is it fair to say you had complaints about the diaries the entire time you were using them?

A. Not ib the early times, but as there were more choices, it was harder to do.

Q. What kind of complaints did you have?

A. Response rates.

Q. What do you mean by that?

A. It's important to get high response rates so that you know you have a representative sample. When I first went to work for Nielsen, response rates on the diary were probably about 80 percent of the people returned them. Today, it's about 6 percent.

Q. And what types of groups or communities typically complained about the diaries?

A. Well, mostly it's small markets.

Q. And you also worked on the Local People Meters; right?

A. Local and national.

Q. Okay. What kind of work did you do on

the LPMs?

A. I looked at response rates. I looked at type of people who responded. We examined and interviewed people to make sure that they understood what they had to do in terms of being in a people meter sample.

Q. And when the LPMs were first rolled out, did you get complaints on those too?

A. Rarely.

Q. And you certainly testified that you worked on the National People Meter, the NPMs. What role did you play in the development of the NPM?

A. I tested the meter. The original homes, I interviewed them to make sure that they understood what they had to do. When Nielsen began the measurement of Hispanics, we realized that the household size was bigger and having eight buttons wasn't enough. So in larger households, we developed a meter which I designed that had 16 buttons for people to press.

Q. And it was on the NPMs that you testified before the Congress?

A. No, it was on the LPM.

Q. I'm sorry; on the LPM. And as for the diaries in addition to -- I suppose the change to the NPM was the result of complaints from the Hispanic community because of under-representation; is that right?

A. On the local market.

Q. On the local markets. But you did get complaints about NPM also; right?

A. Rarely.

Q. But you didn't get complaints about NPMs or the LPMs?

A. We got a lot of complaints on the LPMs.

Q. Okay.

A. We -- we being Nielsen -- did a lot of work with customers, users of the data to make them understand what was different and what the methodologies were. And even here, like any sample, you don't get the same cooperation from everybody, which is why weighting becomes important.

Q. In general, is it -- is it unusual for different communities to complain about -- to have dissatisfaction with Nielsen measurements in general?

A. Whenever there is a change, there are people who are worried about the change. The problems with Local People Meter was that response rates were different for different types and so minorities were not properly reported. And that was what the hearings were about and that was what was changed.

Q. And generally speaking the complaints tended -- tend to be by -- mostly by people that think that they are -- somehow their audience is underrepresented or understated or both; right?

A. Most people don't complain if they are getting extra viewers, only if they are not getting enough.

Q. Okay. Do you know how long Nielsen has been -- are you aware -- you certainly are aware that Program Suppliers use Nielsen data for this proceeding; correct?

A. Yes.

Q. And do you know how long Nielsen has been providing viewing data to Program Suppliers for use in these royalty distribution proceedings?

A. I don't know in terms of the royalty

procedures, but the industry has been using Nielsen data since Nielsen became the supplier.

Q. In fact, it's been the sole surviving audience measurement company, hasn't it?

A. Pretty much.

Q. And while you were at Nielsen, did you have any involvement at all in the data gathering for the prior data that -- for data that Program Suppliers received in prior proceedings? Did you have any involvement in the development of that data?

A. I did in terms of the proceedings related to Local People Meters, if that's what you're asking.

Q. I'm talking in terms of the data that Program Suppliers received from Nielsen for proceedings prior to this one, whether you had any involvement in the development of that.

A. I have been very involved in the creation and use of National and Local People Meter data, but I have not been involved in individual groups' use of that data.

Q. Okay. So your involvement has been just development of the database itself; right?

A. And looking into questions when users

of the data were concerned that with its accuracy.

Q. But you never worked directly with clients?

A. Just agencies and networks.

Q. Now, are you aware of any discussions that Program Suppliers had with Nielsen's staff before Nielsen began the analysis that Nielsen did for this proceeding?

A. Not for this proceeding.

Q. And do you know the persons that Program Suppliers communicated with besides Paul Lindstrom, before and during the development of the analysis that was used for this procedure?

A. I was not involved before learning about this proceeding.

Q. Do you know Paul Lindstrom?

A. I know Paul Lindstrom.

Q. So -- and do you know whether -- I assume you also don't know the information that Program Suppliers conveyed to Nielsen's staff in developing the analysis for this proceeding?

MR. STEWART: Objection. Lack of foundation. I'm not sure the witness

understands the terms of art that Mr. Olaniran is using.

MR. OLANIRAN: I can clarify if she doesn't understand. I am happy to do that.

JUDGE BARNETT: Perhaps it's better to form the question without beginning it "I assume."

BY MR. OLANIRAN:

Q. Okay. Do you know whether Program Suppliers informed the Nielsen staff of what -- of the -- what they intended to do with data that they requested from Nielsen?

MR. STEWART: Objection. The witness testified she hasn't been at Nielsen for 18 years. I'm not clear what Mr. Olaniran is referring to, but that needs to be clarified on the record.

JUDGE BARNETT: Well, if she can answer the question, she may. She hasn't been there for 18 years, so I think that speaks enough to whether she has the ability to answer the question on a current basis.

Ms. Shagrin, if you can answer the question, you may.

THE WITNESS: I would not have been

aware of those conversations.

BY MR. OLANIRAN:

Q. Okay. In fact, you haven't had any conversations with current Nielsen staff about the data that was provided to Program Suppliers for use in this proceeding; is that correct?

A. That is correct.

Q. Okay. And you -- when you were talking to Mr. Stewart about validity and reliability about the NPM data, were you referring in general -- were you referring in general to the NPM database itself or were you referring to Dr. Gray's analysis?

A. I don't understand your question.

Q. Okay. You had a conversation when you were -- in your Direct Testimony you were talking about validity of data and reliability of data. Did you intend for that reference to be just for the NPM database or were you referring to Dr. Gray's analysis as being unreliable and invalid?

A. I was referring to the use of the industry of Nielsen data and my opinion of the work that was used for this project.

Q. Okay. So you were referring to

Dr. Gray's analysis?

A. As not being valid and reliable?

Q. Yes. Is that what you were referring to?

A. Yes.

Q. Okay. But the database in and of itself, the Nielsen NPM you considered to be valid and reliable; is that right?

A. If it's correctly used.

Q. But the NPM is a study in and of itself; correct?

A. It's a sampling in and of itself.

Q. Do you consider the results of this -- the results of that sample valid and reliable?

A. Yes.

Q. What is your understanding of the purpose of Dr. Gray's analysis?

A. I don't know exactly what the purpose is, but I do know that all of the steps that are required to get reliable data were not done in this analysis.

Q. Did you understand Dr. Gray to be computing ratings?

A. Yes, but he was just using raw ratings.

Q. He was using raw ratings, so was he using raw viewing data?

A. He was using raw viewing data that was not totally representative.

Q. Representative of what?

A. Of distant viewing.

Q. Did you read Dr. Gray's testimony?

A. Yes.

Q. And -- and did you understand that he was developing an econometric model?

A. It's what he was attempting to do. It's not what I would consider a valid research.

Q. I guess, did you understand that he -- he was developing an econometric model -- a regression analysis? Did you understand that?

A. He was attempting that.

Q. He was attempting -- you think he was attempting a regression analysis; correct?

A. Yes.

Q. You didn't think he ultimately performed a regression analysis?

A. Well, he performed. I'm not sure he did it right.

Q. Are you an econometrician?

A. No.
Q. Have you actually developed a regression analysis on your own?
A. No.
Q. Okay. Do you understand the variables that Dr. Gray used in his regression analysis?
A. No.
Q. Do you understand the role that the raw viewing data played in his regression analysis?
A. My understanding is he used the numbers as they were given to him.
Q. And he didn't do anything else with the numbers?
A. My understanding.
Q. Okay.
MR. OLANIRAN: Excuse me, your Honor, for just a second.
(Mr. Olaniran conferring with Ms. Plovnick.)
BY MR. OLANIRAN:
Q. Ms. Shagrin, do you recall whether during the 2010 through 2013 time frame Nielsen expanded the NTM markets?
A. Expanded the sample?

Q. Yes, expanded the sample; I'm sorry.
A. I am aware.
Q. And what exactly did Nielsen do?
A. They increased the sample size by -- across the total U.S.
Q. And did that affect the local markets also?
A. The local market samples, some of them were increased, not all of on them. But again, the way it was done with weighting, everyone ended up being representative.
Q. While you were at Nielsen, did you understand that clients very often requested custom work from Nielsen?
A. Yes.
Q. And did it come in basically two types, either customer analysis or custom design; correct?
A. Custom analysis, yes. Customer design, not very often.
Q. And what is custom analysis?
A. It is to say I want to look at the ratings of every show that's an hour. I don't want to look at anything but an hour. I want to look at households that have an 18- to

34-year-old.

Q. And when the clients request that information, do they generally inform -- would they have informed Nielsen of the objective of the data request?

A. Sometimes.

Q. Okay. And the data that Nielsen provides them, it's usually data that's within the Nielsen database itself; correct?

A. Yes.

Q. Okay. And when customers request information from Nielsen, it's not subject to the MRC audit, for example, because it's private -- it's data for private use; correct?

A. It would not be separately audited. But the database from which that data was pulled would have been part of the audit.

Q. The NPM data, for example, would have been part of the MRC audit from 2010 to 2013; correct?

A. Yes.

JUDGE FEDER: Excuse me. Ms. Shagrin, could you please define for us what the MRC audit is?

THE WITNESS: Happy to do that. The

MRC is the Media Rating Council. It was developed as a result of hearings around 1964, and it was important because it is the currency for the media business.

And so that created the Media Rating Council, and the obligation to audit any data that Nielsen collected for any of its services that was being used as currency. So the local markets are audited, the national markets are audited. And the purpose of the audit is to make sure that the sample design is right. And if the sample design is right, are the processes used to put the data together correct and do they do what they say they're doing? And that's why every single year every product is audited.

JUDGE FEDER: Thank you.

BY MR. OLANIRAN:

Q. And I think you said that to some extent there was custom design; is that right? Clients would request custom design of Nielsen -- of Nielsen data?

A. It would be pulling data together, but the raw data had already been audited. I think -- so it might be that I only want to

look at households that have a Toyota.

Q. And then this also, the custom research that Nielsen also does, which I think is more in line with what you just told me; right?

A. There is less custom research than there was many years ago.

Q. But there are costs associated with all of this different types of custom work, are there not?

A. I'm not sure I understand your question.

Q. The clients have to pay for these custom works to be done to be performed by Nielsen; is that right?

A. Yes, depending on what they're asking for.

Q. Nielsen is not cheap, is it? Strike that.

So if a client were to seek custom analysis of Nielsen's existing database, it would not be unusual for a client to seek information from Nielsen's existing database to use for some other purpose; right?

A. But the basis for that would have been

audited data.

Q. I'm sorry; I didn't --

A. The basis for looking at data by segmenting it differently would always be using data, raw data that had already been audited.

Q. And for the 2010 through 2013 period, the NPM was audited; right?

A. Yes, every year.

Q. And it would not be unusual for a client to come to Nielsen and consult with Nielsen with regard to what their intention for the data -- for use of the data was; right?

A. I'm not sure I understand your question.

Q. Could a client have come to Nielsen during that period and consulted with the staff about what they needed with regard -- what they were trying to accomplish, and then Nielsen make a recommendation as to what was the most -- what was the best database from which that information to be extracted?

A. That could happen. I don't remember ever seeing anybody who pulled data that way and used it.

Q. You said in your testimony that

distant signals are more prevalent in smaller markets than in larger markets. I think you testified to that this morning; correct?

A. Yes.

Q. Now, are you saying that any of Dr. Gray's analysis was biased in favor of or against smaller markets?

A. I don't have the detail of what he did, so based on what I read, I don't think there was any difference in how he treated them. But I do think he should have had some differences.

Q. Now, if a syndicator -- if a syndicator wanted to develop an audience estimate for a program; right?

A. Uh-huh.

Q. Could that syndicator go to Nielsen and have Nielsen aggregate across the country to do so?

A. Using data that had already been collected and weighted, yes, that happens.

Q. Is it true that if someone were to examine the respondent level viewings for a syndicator estimate for any Nielsen NPM, you could find instances where the number of

households represented would be greater than the number of subscribers for the system?

A. I don't understand your question.

Q. Which part are you having trouble with?

A. I'm not -- I don't understand what you're asking.

Q. My question is if you looked at a respondent level estimate for any Nielsen NPM, that you could find instances where the number of households represented by that NPM would be greater than the number of subscribers to the system in that particular area.

A. I would be surprised if that happened. But in any event, they would have used the particular weight for that household. So if you wanted to look at something and you have particular kinds of households that you want to accumulate and see what the ratings were or what they were watching, you could do it. But you wouldn't start with raw data. You would start with data that had already been weighted.

Q. Okay.

MR. OLANIRAN: Those are all my questions. Thank you very much.

MR. MacLEAN: Three questions, your Honor.

JUDGE BARNETT: I'm counting.

MR. MacLEAN: Three hours of questions.

(Laughter.)

JUDGE STRICKLER: Are there any Greek letters?

CROSS-EXAMINATION

BY MR. MACLEAN:

Q. Good morning, Ms. Shagrin. I'm Matt MacLean. I represent the Settling Devotional Claimants.

For the time period at issue in this proceeding, 2010 to 2013, do you know whether Local People Meter -- we are talking about Local People Meter here -- whether Local People Meter measurements were available in all markets?

A. They were not.

Q. During this same time period in question, 2010 to 2013, do you know if Nielsen diary measures were available in all markets?

A. They were not.

Q. Were Nielsen sweep measurements

available in all markets during this period of time 2010 to 2013?

A. Sweep measurements were available; however, not every market was using the same methodology.

Q. I understand. Okay. Thank you.

MR. MacLEAN: No further questions.

JUDGE BARNETT: Any further questions for Ms. Shagrin? Redirect?

REDIRECT EXAMINATION

BY MR. STEWART:

Q. Ms. Shagrin, I wanted to follow up with you on a conversation that Mr. Olaniran had with you about MRC accreditation of the NPM. Do you recall that? Do you recall your conversation with him?

A. Yes.

Q. Now, I'm sorry, MRC accreditation based on MRC audits is for a particular product; is that right? Or a service offered by Nielsen?

A. Each service is -- each service that is syndicated is audited. So that the local market diaries are audited, the local market people meters are audited. The national sample

is audited.

Q. So the NPM ratings, national ratings reports, that's what's audited; is that correct?

A. That is -- that service is audited every year.

Q. And is the MRC accreditation considering the purpose for which the service is offered as part of investigating whether it's properly done?

A. The audit would look at the sample to make sure that it was representative. They would look at any changes in methodology at the weighting controls.

Q. Here is my question. Is the MRC accreditation of the NPM product sufficient to allow it to be used, for example, to project local viewing in the Yakima, Washington, market?

A. No, it's sufficient for national.

Q. Only national; is that correct? Only national?

A. Only national.

Q. And is that accreditation -- does that accreditation consider as a necessary part of

the accreditation the weighting that Nielsen applies to the NPM households?

A. Very critical.

Q. Thank you.

MR. STEWART: No further questions.

JUDGE BARNETT: Thank you very much, Ms. Shagrin. You may be excused.

Who is our next witness?

MR. ERVIN: Commercial TV clients are going to call Dr. Bennett.

JUDGE BARNETT: Is he here?

MR. ERVIN: Yes.

JUDGE BARNETT: Let's call him. Before we do, let me just update you on our availability. It looks like Friday the 16th and Wednesday the 21st will be the only days we will be available to make up for lost time. So I hope you can work around that schedule.

MR. MacLEAN: Your Honor, I don't know if you were asking, but unfortunately as we've said before, I have a hearing in another State on the 21st. And so depending on what's going on -- and Mr. Lutzker also has another out-of-State engagement in on the 21st. We'll do our best with what we can, but just to alert

the Judges.

JUDGE BARNETT: Thank you.

Be careful. A lot of snakes on the floor.

THE WITNESS: I will.

JUDGE BARNETT: Before you sit down, raise your right hand.

Whereupon,

CHRISTOPHER BENNETT

was called as a witness and, having been first duly sworn, was examined and testified as follows:

JUDGE BARNETT: Please be seated.

DIRECT EXAMINATION

BY MR. ERVIN:

Q. Good morning, Dr. Bennett.

A. Good morning.

Q. Would you please introduce yourself and spell your last name for the record.

A. Sure. My name is Christopher Joseph Bennett. And my last name is spelled B-E-N-N-E-T-T.

Q. And how are you currently employed?

A. I am a Principal at Bates White, which is an economic consulting firm here in D.C.

Q. And would you please describe your

educational background for us.

A. Sure. I have a Bachelor's degree with concentration in Economics and Finance, I have a Master's of Arts degree in Economics, and I have a Ph.D. in Economics with a concentration in econometric methods, which is essentially statistical methods applied to economic data.

Q. Before you became a consultant at Bates White, how were you employed?

A. Prior to joining Bates White, I was an assistant professor at Vanderbilt University in the Department of Economics.

Q. What kind of courses did you teach while you were an assistant professor?

A. So during my five years at Vanderbilt, I taught courses in statistics and econometrics at all levels, so undergraduate, master's and Ph.D. level courses.

Q. Did you also teach similar courses at other universities?

A. I did. I taught courses in math for economists in statistics and also in econometrics at various institutions, including Johns Hopkins, the University of Waterloo, and the University of Western Ontario.

Q. In addition to your teaching responsibilities, did you conduct research and author academic articles?

A. I did, and I continue to do so.

Q. Have you conducted research on econometric and statistical methods specifically?

A. Yes. So in a number of papers I've developed new statistical and econometric techniques. And I've published these papers in various academic journals, including the Journal of the American Statistical Association, the Journal of Business and Economic Statistics, and also in the International Economic Review.

Q. And have you conducted research involving the reliable measurement of economic phenomena?

A. I have. I have done research on measurement issues in a variety of contexts, including the measurement of poverty inequality and financial risk. I've published this work in different journals, including Econometric Reviews, and the Journal of Economic Inequality.

Q. And has any of your research involved the use of bootstrap sampling methods?

A. Yes, it has. In fact, the bulk of my research has involved the use of bootstrap methods. A number of the publications, including the Journal of Financial Econometrics and the Journal of the American Statistical Association, are both involving the appropriate use of bootstrap methods for drawing inference.

Q. Would you consider JASA, the Journal of the American Statistical Association, to be one of the leading, if not the leading, publication in the field?

A. Yes, so JASA is, or Journal of the American Statistical Association, is widely considered the leading journal for statistics.

Q. Have you been invited to speak and attend conferences that cover the topics, economic topics, econometrics, and related?

A. Yes, so I've been invited and attended a number of conferences where I've spoken on my research. I've also been invited to various academic institutions to speak.

Q. With your written testimony you submitted a copy of your CV; is that right?

A. That's correct.

Q. Does your CV contain additional information about your publications, qualifications, and experience in the field of econometrics and economics?

A. Yes, it does.

Q. Have you worked with databases in your role as a teacher, researcher, and consultant?

A. Yes, I've worked with databases in all three capacities.

Q. Could you summarize a bit some of that experience, specifically designing and developing databases for statistical analysis?

A. Sure. So I've worked on a variety of projects where, you know, I've been involved in, you know, in some instances collecting data, cleaning data, confirming the accuracy of it. Also appending and merging datasets to create, you know, a database from which I can reliably draw an inference.

Q. And do you also have professional experience designing and drawing statistical samples?

A. Yes, I do. I worked on a number of projects involving the design of statistical

samples and the implementation of sampling, as well. As an example, I've been involved advising the U.S. Department of Justice with the design and implementation of statistical sampling for the purpose of several investigations into mortgage underwriting practices by various originators.

Q. You were part of the team that was working for the Department of Justice?

A. That's correct.

Q. Dr. Bennett, what were you primarily asked to do in this case on behalf of the Commercial Television Claimants?

A. So my primary responsibility was to create a database which linked information about cable systems and their carriage of distant signals with the programming that actually appeared on those stations. I was also asked to categorize the programming that appears on the distant signals in accordance with the definitions that I understand were agreed upon for this proceeding.

Q. And were you also asked to conduct some geographic measurements and data calculations for exhibits that were used by

other CTV witnesses in this case?

A. Yes, I was. I was asked to perform calculations of distances between distant signals in the communities that they were carried to, and also to prepare several maps showing the location of, you know, specific stations and, again, the communities into which they were importing.

Q. Were you also asked to review some of the testimony submitted by other experts in this case, including Dr. Gray and Mr. Horowitz, on behalf of the Program Suppliers?

A. I was, yes.

Q. Did you provide a written statement, both a direct and rebuttal statement, in this case?

A. I have, yes.

Q. I placed in front of you a binder that includes Exhibits 2006 and -7, which both have been admitted into evidence. I'd ask you to just review them.

Can you confirm for us that Exhibit 2006 is a copy of written Direct Testimony that was filed originally on December 22nd, 2016, corrected on April 11,

2017; is that correct?

A. Yes, it is.

Q. And is 20007 a copy of your written Rebuttal Testimony that was filed on September 15th, 2017?

A. Yes, it is.

Q. Do you have any corrections to Exhibit 2006?

A. I do.

Q. You want to turn to page 11?

A. So there is a correction in the figure heading. It says the Distribution of Distances Between Communities and Important Distant Signals that should be "imported" as opposed to "important."

Q. Okay, great. Any others for 2006?

A. No.

Q. How about for Exhibit 2007? Do you have corrections there?

A. I do.

Q. Okay. Why don't you take a look at page 11 to start. Specifically paragraph 32.

A. Yes, so there is a typo on the third line. So it says, "between 26 percent and 28 percent." And this is in reference to

Figure 10, the population numbers in Figure 10. It should be "24 percent and 27 percent."

Q. Okay. And do you have one other correction that you want to make here on page -- the next page on paragraph 39? Actually two pages later.

A. Yes, so on the third sentence beginning, "Conversely, just the fact that Dr. Gray under-samples educational stations in each of 2010, 2011, and 2012." That should be "in each of 2010, 2011, and 2013."

Q. Change 2012 to 2013?

A. That's correct.

Q. Okay.

JUDGE BARNETT: Could you give us that page number again, please.

MR. ERVIN: Yes, ma'am. It is page 14 of Exhibit 2007, paragraph 39.

BY MR. ERVIN:

Q. Now, were you directly responsible for the preparation of both of these Exhibits 2006 and 2007?

A. Yes, I was.

Q. And aside from the corrections that you've made today and that have been

incorporated, do you declare that this testimony is true and correct and of your personal knowledge?

A. Yes, I do.

MR. ERVIN: Your Honor, we proffer Dr. Bennett as an expert economist and econometrician with experience in statistical methods and measurements.

JUDGE BARNETT: Hearing no objection, Dr. Bennett is so qualified.

MR. ERVIN: Thank you.

BY MR. ERVIN:

Q. Now, Dr. Bennett, were you the economist at Bates White primarily responsible for developing the database that was used for Dr. Crawford's regression?

A. Yes, I was.

Q. When did you start working on the development of the database?

A. I started working on this engagement just over four years ago. I think the categorization process and algorithm was probably about a year into that. So maybe about two years ago.

Q. When you get an assignment like this,

and with your experience in creating databases, what kind of considerations are you given for the data that you are looking for and wanting to obtain?

A. So first and foremost, I think, you know, getting an understanding of the questions that one is going to want to answer and then identifying sources of data that would enable one to, you know, address the question of interest.

You know, and I think having identified potential sources of such data, then, you know, verifying that you have reliable sources that are as comprehensive as possible and accurate.

Q. Could you describe the data sources that you used here to create the database?

A. Yes, so the primary data sources were from the -- from Cable Data Corporation, or CDC, which digitizes the information about cable systems directly from the Statement of Account forms.

The other principal source is information about programs, airings data, and also stations from FYI Television.

Q. And does the FYI television database include the information that comes directly from the stations?

A. Yes, they do source their scheduling data directly from stations.

Q. Let's take a look at Figure 1 in your Exhibit 2016, which is your written testimony, which is on page 4. Does this include a summary of the data that was from that CDC database?

A. Sorry; Figure 1 on page --

Q. Figure 1 or the screen right in front of you as well. Fancy that.

A. Yeah, I was looking at the wrong figure. So Figure 1 here is a summary of the CDC database in terms of the number of Form 3 cable systems. And this is an average within each year. And then it's also providing information about the gross receipts and total royalties that were paid within each year.

Q. Let's take a look at Figure 2 in Exhibit 206, which is page 5 of your Direct Testimony. What does this figure show us?

A. So this figure is giving information about subscriber groups. It's showing for

example that the average number of subscriber groups per system were increasing from 2010 to 2013. So from roughly three in 2010 to just north of four in 2013.

It's also providing information about the average number of communities that were served by subscriber groups and the average number of distant signals that were retransmitted by subscriber groups.

Q. And this is all information -- and specifically I wanted to confirm on the subscriber group -- information that you wanted to identify in the database?

A. So the information -- so this table or this figure is just summarizing the information about these subscriber groups themselves. The subscriber groups are also contained within the database. The CDC data.

Q. Okay. So what is the significance of the subscriber group information?

A. So having the information about subscriber groups -- and actually let me step back. The subscriber group allows cable systems to split up their, you know, their channel lineups and their carriage of distant

signals based on the subscribers that actually receive those signals.

I need you to repeat the question.

Q. You answered it.

A. Okay.

Q. Let's shift to the FYI Television database. Okay? Were you provided the entire program database for the period January 1st, 2010, through the end of 2013?

A. I was provided with FYI's entire database of programs, stations which broadcast, and network stations, cable stations, and all of the earnings data for that period.

Q. Why license the entire database for the four-year period?

A. There are a number of benefits to having the entire database. One is there is no need to rely on statistical sampling which could introduce, you know, some uncertainty into -- and imprecision. Also, there are benefits for the categorization of programs.

Q. Let's take a look at Figure 3 in Exhibit 2006, which is page 6 of your Direct Testimony. Could you describe these summary statistics for the FYI database?

A. So the summary statistics that are displayed here are to give a sense of, you know, the size of the database. It's giving information about the count of broadcast stations IDs, the count of cable station IDs, the number of unique programs in the database, and also the total number of hours of broadcast programming that are in the database.

Q. So in specifically the FYI database, it assigns a unique ID for each broadcast station, cable station, and program; is that right?

A. Yes, so each broadcast station is assigned a unique station ID. The same with programs. So each unique program is assigned a unique program ID.

Q. Why don't you describe why that -- how that information was helpful when you were merging the FYI data with the CDC data.

A. It's -- so of that information, it's really the station information that is useful in merging between the databases. So the FYI database has, you know, not only -- we have from the FYI database not only the universe of stations, but those stations can then been

mapped to the CDC data which also includes information about individual stations.

Q. Then what specific information about stations you've identified here on the FYI database, what specific information about stations did you use getting down into the call sign issue?

A. Well, so information about when merging we are looking at four-letter call signs, suffix information. There is additional information including like station affiliate that is in both databases that allow us to, you know, identify the correct matches between FYI and CDC.

Q. And did that station affiliate information help you to ensure a higher degree of accuracy?

A. Yes, that's correct.

Q. Now, did you have any challenges in your merging of the two datasets, the FYI data and the CDC data?

A. Yes, there were a number of challenges. For example, the FYI database does not include high definition stations. It includes the standard definition simulcast.

And the reason for that is the airings information is common to both, so they are just not maintaining essentially duplicative airings records.

So when we looks at CDC data in contrast, we have both high definition and standard definition. We just have to be careful that -- you know, we're pairing up from the CDC the standard definition with the high definition in order to match the correct standard definition version in the FYI database.

Q. And this process, that took some time?

A. Yes, it did.

Q. Let's talk a little bit about your categorization, so first programs then minutes. Now, do you believe that the FYI database contained a rich set of program information that would allow you to categorize the programs in accordance with the defined program categories that we have here in this case?

A. Yes, both rich program information and the rich airings information, as well.

Q. Did you develop an algorithm that could be used to categorize the programs based

upon that information in the FYI database?

A. Yes, I did.

Q. Why did you need to develop an algorithm?

A. Well, so the definitions are a set of rules and, you know, these rules can be, you know, developed in a computer program to more efficiently sort the programs.

Q. Did you review the testimony of economists from previous Cable Royalty Proceedings who had used regression analysis to help inform the logic and the rules that you applied and implemented in the database?

A. Yes, I did.

Q. And which testimony did you look at?

A. So I looked at testimony from Dr. Ducey who worked -- it was the '04-'05 proceeding. He had done work on categorization that was then used by Dr. Waldfogel in his regression analysis. And I reviewed the -- I think reports from both and also some underlying materials.

Q. Now, in that '04-'05 case they used a two-year sample. Do you recall that?

A. Yes, they had sampled airings data for

the stations.

Q. And here you are using a four-year period of the entire dataset; right?

A. I'm using the entire database from FYI.

Q. Now, by using the entire database, did you have access to certain data that would be unavailable if you were using a sample base that would help you more accurately identify programs by category?

A. Yes, I was. So, for example, having all of the airings data for the entire period, or within a given year, allows me to identify, you know, the airings for programs throughout the entire year. So if I'm interested, for example, in identifying whether a program aired on more than one broadcast station, I'm able to track that airing and count the number of stations on which that program aired.

The ability to do that is relevant to categorizing the CTV programming where a program is, among other eligibility criteria, it is one and only one broadcast station.

Q. So it's something that you could do with the whole dataset, but you wouldn't be

able to do it with a sample?

A. I could calculate that from a sample, but there is a chance that there would be an error from that calculation, because I would only be able to count the number of airings based on the airings data within my sample, but not outside of it.

Q. Let's take a look at Appendix D in Exhibit 2006, which is your page D1 of your Direct Testimony.

JUDGE BARNETT: Before we go there, why don't we take our noon recess. We will be at recess until 1:10.

(A recess was taken at 12:10 p.m., after which the hearing resumed at 1:20 p.m.)

AFTERNOON SESSION

(1:20 p.m.)

JUDGE BARNETT: Please be seated. Should we continue?

MR. ERVIN: Yes, Your Honor. Thank you.

BY MR. ERVIN:

Q. I think we were just about to take a look at Appendix D in Exhibit 2006, so why don't we do that. Turn to page D-1 of your direct testimony.

Dr. Bennett, can you take a look at Appendix D? Is this the categorization steps, the categorization algorithm, that we've been talking a little bit about?

A. Yes, Appendix D sets out the sequence of steps in the logic that I apply to categorize the programs.

Q. Okay. And could you talk a little bit about that step-by-step process, the language in here that you used, "identifying and categorizing" and then removing programs? How does that process work?

A. Right. So as I said a moment ago, it's a sequential process by which, you know,

here in Appendix D, I describe starting with the Big-3 network programming, and I identify those programs first. Then I remove them from the set of programs that require, you know, further review and categorization. And I do that sequentially with each claimant group.

Q. Until they're all covered in the process?

A. Yes.

Q. Okay. Now, were you able to categorize every television programming minute during this four-year period in the data set?

A. No. So while I had the entire FYI database, there were still some stations for which I didn't have complete airings data. And those remain uncategorized.

Q. So you put them in an uncategorized?

A. That's correct.

Q. Okay. And did that uncategorized programming account for less than .8 percent of the total station accounting period subscriber group observations?

A. Yes, that's correct.

Q. Now, is it fair to say that some parts of this categorization process were more

straightforward than others?

A. Yes, indeed. For example, categorizing PTV programs requires only information about the station on which the program appears. So, you know, if a program is on a non-commercial educational station, it is identified as PTV.

I don't need further information about genre or airing type or anything.

Q. Okay. And then were there other parts that were a little bit more nuanced?

A. Yes. For example, you know, identifying CTV programs requires information about the program itself, but also, you know, how widely aired it was, right? So CTV requires that a program air on no more than one U.S. broadcast station.

Q. Okay. Now, let's take a look at Appendix C in Exhibit 2006, which is page C-1 of your direct testimony.

Now, could you describe a bit about these new fields and confirm, were these some of the fields that you created to help address some of these more nuanced program categorization issues?

A. Yes. So these are fields that I calculated from the FYI data and the airings data. So it's -- these are all based on information that's contained within the database. It's just aggregating that information up in a way to make it useful and easy to incorporate into the categorization algorithm.

So, for example, at the top, the total number of stations airing a given program ID, so those are unique programs, and I'm able to track the number of stations on which those programs aired to assist with categorizing, you know, CTV versus non-CTV programming, for example.

Q. Okay. So you're not adding new data; you are simply adding a calculation shortcut to capture the data within the FYI database?

A. That's correct. These are just, as I said, information from within the database, not supplementing it or changing it. It's just in a sense to assist with the categorization logic.

Q. Okay. So was it -- is it fair to say that your goal was to accurately categorize the

problem -- the programs by category type as accurately as you could?

A. Yes, that is the stated goal, yes.

Q. So how did you -- how did you refine, enhance the accuracy of the categorization algorithm that's in Appendix D?

A. So the -- the algorithm in its development was an iterative process. So what we would do, you know, together with my team, is review which programs were impacted by various rules, you know, identify how they're being moved to which categories and, as part of that review, to identify whether any programs were being moved incorrectly.

If that were the case, we would use that to help refine or potentially introduce exceptions where necessary.

Q. So did you -- did you export sequel sort of queries to be able to do that on a program-by-program kind of basis?

A. Yes. So, where necessary. So, for example, I didn't need to review on a program-by-program basis for programs that were airing on, you know, non-commercial educational stations, but for other claimant categories, we

would export lists of programs and review them.

Q. Okay. And did this query process help you to determine which category title and genre fields and other program characteristics that were included in the FYI database should be used to help make sure that your algorithm was properly categorizing each program?

A. Yes. So as I described, it was an iterative process. So as we would identify a program that, you know, was not or a set of programs that were not being categorized correctly with a given set of rules, you know, I together with my team would look at whether additional data is available or can be created, for example, like the calculation of the total stations, the total number of stations on which a program aired, to assist in refining that categorization.

Q. And did you also have the opportunity to review additional information and resources, you know, web sites and other publicly available information, where you had questions about a particular program?

A. Yes. There were certainly programs for which I was unfamiliar and I would

supplement, you know, the review of programs with, you know, using Google or Wikipedia, you know, finding web sites associated with programs, finding clips of programs on YouTube.

You know, this process of trying to, you know, refine and ensure accuracy of the categorization.

Q. And then that -- would it be fair to say that the result of that process is then represented in what you decided -- which terms you selected to help identify and categorize the programs?

A. Yes, ultimately, where I landed was a result of that -- that iterative process and incorporating everything that I had learned with respect to, you know, accurately and correctly identifying the -- the correct claimant program --

Q. So --

A. -- category.

Q. So did you reach a point where you believed that you had refined it and got it to a place where the algorithm appeared to be accurately categorizing programs?

A. Yes. I did. Based on the data that I

had available to me, I was confident that the categorization was accurate.

Q. Okay. So now after you file your original direct testimony in December of 2016, did you receive copies of reports and underlying materials that were produced by other experts in this case for other claimants?

A. Yes, I did.

Q. And did you review your categorization again after receiving those additional materials?

A. I did, yes.

Q. And what did you find?

A. So upon reviewing my categorization against that of other experts and, in particular, Dr. Gray, I did uncover some discrepancies between my categorization and his.

And, more importantly, what I noted was his reliance on CRTC data and some information that was relevant and potentially useful to refining my categorization.

Q. And --

JUDGE BARNETT: For the record, could you say CRTC in real words?

THE WITNESS: Yes, the Canadian Radio, Television and Retransmission Commission.

JUDGE BARNETT: Thank you.

BY MR. ERVIN:

Q. And telecommunications?

A. I'm sorry, telecommunications commission, yes.

JUDGE BARNETT: Thank you.

BY MR. ERVIN:

Q. Once you had access to the information from the CRTC or Canadian Radio, Television and Telecommunications Commission, what information was contained in that data that you did not have before?

A. So that data set contains information about the country of origin for a program, which is particularly useful for the categorization of Canadian Claimant programming.

Q. Okay. And then so once you had that information, did you decide to make some recategorizations or change the assignment of some of the programs?

A. Yes. So with that, armed with that new information, I revisited my categorization,

incorporating the additional data, the additional fields, again, with, you know, the stated goal to accurately categorize.

And I did, as a result of incorporating that information, refine the Canadian Claimant -- the categorization of the Canadian Claimant programming.

Q. Okay. And did you also make a couple of other changes based upon information that you observed from other experts and other underlying materials?

A. Yes. The primary change was the revision of the Canadian Claimant category. And as part of that review and moving those programs, there were additional refinements to, I believe, the Devotional and Sports categorizations.

Q. And did you -- do you recall what percentage of the programs were affected by this recategorization step?

A. I believe it was .2 percent.

Q. So .2 percent of the total hours of categorized programming?

A. Yes, that's correct.

Q. Okay. Let's take a look at Appendix

D, page D-5, this is Exhibit 2006, and specifically step D.12, entitled Recategorization.

Is this the step in the process where you make your recategorizations you just described?

A. Yes. So this step is, you know, incorporating the list of programs that were moved as a result of the revision.

Q. Okay. And when you made this recategorization, how did you produce the recategorization? Did you use patch files?

A. Yes. So the idea here is to, you know, add this step to the end of the categorization process that I originally produced. The patch form was, you know, similar to a patch for, you know, software, which was to -- you know, instead of requiring other claimants to run through the entire process from start to finish, it's just at the tail end to move the programs according to the revision that I made.

There were two patches that were issued, so one was just a list. It's a set of code that would incorporate the list of

programs that need to be moved.

There was a -- and that was patch A. There was also patch B, which was here is the -- excuse me -- here is the underlying adjustment to the logic. Here is the CRTC data that I relied on.

So it was the full step, allowing the other claimants to identify and follow why these changes were being made.

Q. And the changes that you just described, were these the ones that you made when you filed your corrected direct testimony in April 2017?

A. Yes, that's right.

Q. Now, did you learn in early September 2017 that one of the claimants' experts, Dr. Erdem, was having a potential replication issue with some of the figures in Dr. Crawford's tables in his written testimony?

A. I did learn -- I believe it was September 5th that I became aware of a potential replication issue. My understanding is it was Dr. Erdem that was having difficulty replicating, exactly replicating some of the figures.

Q. Okay. And in response to Dr. Erdem's inquiry, what did you determine regarding the updated categorization files, patch A and B you just talked about?

A. So what -- so going back and reviewing the patches, it became clear that my team and I had inadvertently included an additional handful of lines of code. These were -- these were code that were remnants of a robustness check. And they had -- so their inclusion had a slight impact on some of the figures in the reports.

Q. Okay. Now, were you able to assess the impact of the extra lines that were in the categorization patch on the replication?

A. Yes. So the robustness check itself and these lines of code that they were -- you know, that they were examining had, you know, no real impact on the figures. For example, I do recall that -- I believe it's Figure 20 in Dr. Crawford's report, the shares were -- a handful of the shares, not even all the shares, were impacted by at most one-100th of a percent.

Q. Okay. So did you remove the code from

the patch files and then prepare that revised version of the patch files?

A. Yes, we did remove the additional lines of code, and we reissued the patches.

Q. Okay. And did you run it to make sure that it replicated exactly?

A. Absolutely, yes.

Q. The figures?

A. Yes, I checked. And every figure and every report replicated exactly.

Q. Okay. So let's turn for a moment to your categorization of program minutes in the database.

Did you separately categorize compensable and non-compensable programs that distantly aired on WGNA?

A. Yes, we -- I did identify separately compensable from non-compensable for the WGNA programs.

Q. Let's take a look at Figure 5 in Exhibit 2006, which is on page 9 of your direct testimony. Why don't you describe what this snapshot provides and how it influenced the process you used to identify compensable and non-compensable programs on WGNA.

A. Right. So with the entire airings data for each year, you know, I was able to conduct this process here, which is essentially lining up the programs side-by-side on both stations, identifying instances where the same program aired on both, and then flagging that as compensable.

Q. Okay. And just a note, the program that appears at 3:00 o'clock, WGN News at Nine, that looks like it is appearing at 3:00 instead of 9:00.

Would you note the time reference there, the time zone difference?

A. It's -- yeah, this is UTC, so there is a six-hour offset, I believe there.

Q. Okay. Let's take a look at page -- at Appendix D-10, sorry, step D.10 in Appendix D, which is on page D-5 of your testimony, Exhibit 2006.

Is this the step in your categorization process where you're making the compensable programming on WGNA flag?

A. Yes, it is.

Q. Now, did Dr. Crawford ask you to identify duplicative network programming

minutes in the database?

A. Yes, he did.

Q. Let's take a look again here in Appendix D but at step D.11. Is that a description of the process that you used for identifying duplicative network airings?

A. Yes, it is.

Q. Okay. And describe that process, just a bit, if you would.

A. Sure. So in the FYI database, I was also provided with the network data, so I knew what was being fed by individual networks. And using that data, I would look within a subscriber group at, you know, pairs of stations and, in particular, for a distant station, pairs of distant stations or a distant and a local to see whether those pairs of stations were both airing at the same time a program that was being fed by one of these networks.

You know, having identified simultaneous airings of these network programs, I would flag them, allowing, you know, others to then work and identify them directly from the flag.

Q. Okay. So, Dr. Bennett, based on your work on the categorization process and your implementation of the database, do you have an opinion regarding the accuracy and reliability of the information that compiles this database, this combined CDC and FYI database?

A. Yes. I believe that, you know, after extensive review on my own and also, you know, after comparing my categorization to that of other experts and their data sources, I'm confident that the categorization accurately reflects the -- you know, the correct assignment of programs to their claimant categories.

Q. Okay. Now, I want to move to a different part of your testimony, and that was calculations we talked about before, and ask you a couple of questions about those.

If we can first go to Figure 6 in Exhibit 2006, which is page 11 of your direct testimony. Now, does this figure contain a summary of the distance calculations you were asked to do between the location of broadcast stations and the cable communities that received their programming as distant signals?

A. Yes, it is.

Q. Okay. Could you just describe briefly the process that you used to make those calculations?

A. Sure. So what -- the data that's being used in this table is based on, you know, the information about distant signals and the communities to which they were imported.

So for each of those pairs, I obtained coordinates, so latitude and longitude, and then used those coordinates to calculate the distance between the community and the station.

Q. Okay. And were you instructed to exclude the four historical super-stations, WGN, WPIX, WSBK, and WWOR, from this analysis that you did?

A. Yes, that's correct.

Q. Okay. And when you did the calculations, what did the data show you?

A. So the data here, right, it's distance in miles bucketed by 50 or under, 50 to 100, et cetera. When you look at the far right columns, the cumulative percentages in each year, I think what's really notable here is the fact that, you know, more than 90 percent of

all station community pairs are within 150 miles.

Q. Okay. Let's take a look at what's in your binder there as -- pardon me -- Exhibit 2003, which was Ms. Burdick's testimony. And I want to ask you about the maps that are in the back, her Exhibits A-1, A-2, and A-3. That first one there that you see on the screen is Burdick Exhibit A-1 from Exhibit 2003.

Did you calculate this map and prepare it?

A. Yes, I did prepare this map.

Q. And does this map show the geographic concentration of distant system carriage for certain television stations; in this case, WSBT in South Bend, Indiana?

A. Yes, the map shows the location of WSBT and the communities, I believe it's in northwestern Indiana, you know, to which that WSBT signal was imported.

Q. And what data did you look at to create this map?

A. So this is the same underlying data that I used to calculate the distances. Here

I'm taking the coordinates from that earlier analysis and then plugging them into an S&L Kagan mapping software.

Q. Okay. And there are two maps that follow. Let's just look at them real quick. You can look at them in the book there, A-2 or WDBJ in Roanoke, Virginia, and then Exhibit A-3, after that, which is KYTV in Springfield, Missouri.

The same application to each of these, the process you just described?

A. The same process, yes.

Q. Okay. Let's take a look at Figure 26 in Exhibit -- pardon me, let's take a look at Figure 25 in Exhibit 2007. So this is your rebuttal testimony.

And this is a chart that Ms. Shagrin was just referring to during her testimony. Did you prepare this chart, this graph?

A. Yes, I did.

Q. Okay. And just describe, if you would, how you -- the information you looked at and how you made the calculations to create the graph.

A. So this is using information on

carriage from the CDC data and is showing, you know, the relationship between the average number of distant stations that were carried in relation to the number of local stations that were carried.

Q. Okay. And let's take a look next at Figure 26, which is in Exhibit 2007. This is page 28 of your rebuttal testimony.

This is another graph that we were looking at during Ms. Shagrin's testimony. Did you prepare this as well?

A. Yes, I did.

Q. Okay. And the additional line that you added, could you describe a little bit about how you made those calculations?

A. Yes. So here it's the relationship between local carriage and DMA market size, which is shown by the blue line. The other relationship that's depicted here is the carriage of distant stations in relation to the DMA ranking of market size.

JUDGE FEDER: Excuse me. Can you explain what the numbers along the horizontal axis mean?

THE WITNESS: So these are the DMA

rank from 1 to 30. So it would be the top 30 DMA markets.

JUDGE FEDER: So if you rank the markets by number of subscribers, viewers?

THE WITNESS: This is the Nielsen DMA ranking itself.

JUDGE FEDER: So it's viewership, right?

THE WITNESS: I -- I actually would have to double-check on how they -- what exactly the criteria is that they're using to define those -- the market -- DMA ranking, excuse me.

JUDGE FEDER: Okay.

THE WITNESS: Does that --

JUDGE FEDER: So it is -- but it is a -- it is a ranking, so the market size doesn't necessarily decrease linearly?

THE WITNESS: Correct, correct. This is just -- it's just an ordinal ranking, bucketing the largest 30, the next large 30, but that information is not, you -- yeah, that's right.

JUDGE FEDER: Thank you.

BY MR. ERVIN:

Q. And just to be clear, to make sure that's -- on the left side of that horizontal, the 1 through 30, those are the largest DMAs. And then in descending order, your buckets go up to 181 to 209; is that right?

A. That's correct, yeah.

Q. Okay. All right. Now I want to ask you some questions about your review of Dr. Gray's testimony. You reviewed his testimony in this case; is that right?

A. I reviewed -- yes, I reviewed Dr. Gray's testimony.

Q. His direct testimony --

A. Yes.

Q. -- in this case, right?

A. Yes.

Q. Now, did you also review the supporting data and files that were produced by Dr. Gray?

A. Yes, I reviewed all of Dr. Gray's underlying materials.

Q. Let's take a look at page 2 in Exhibit 2007, which is your rebuttal testimony. I want to ask you first, is it your opinion that Dr. Gray has not reliably measured

relative program distant viewership based upon your review?

A. Yes, that's my opinion.

Q. And is it -- is that your opinion because you believe that Dr. Gray's sample design creates bias in his estimations?

A. It's my opinion that the sampling design and the implementation of that sampling design gave rise to bias and imprecise estimates that undermine the reliability of his relative distant viewership.

Q. And is it further your opinion, because you believe that Dr. Gray's distant viewership study and the methodology that he used creates uncertainty, greater uncertainty, as a result of his estimation method and the lack of sufficient distant viewing data?

A. Yes. The methodology and the use of imputation -- I -- yeah, maybe can you repeat the question.

Q. Sure.

A. Just so I state -- yes.

Q. I'm trying to identify the uncertainty that you talk about in your rebuttal testimony. Does the uncertainty about the methodology that

Dr. Gray uses results from both his method, as well as a lack of sufficient distant viewing data?

A. Yes, that's correct.

Q. And then, finally, in support of that opinion that you stated, is it supported by your belief that Dr. Gray overstates the precision of his results in his direct testimony?

A. Dr. Gray overstates the precision of his distant viewership shares but doesn't state or offer any assessment of precision for the program shares.

Q. Okay. Let's turn to each of these three. First, let's start with the sampling.

Does Dr. Gray rely on sampling in his analysis?

A. Yes, he does.

Q. And does he draw a sample of stations?

A. Yes, he does.

Q. Now, are Claimants' programs randomly assigned to those stations?

A. No, they are not. Excuse me. The Claimants' programming is highly clustered by station type.

Q. Let's take a look at Figure 1 in Exhibit 2007, which is on page 6 of your rebuttal testimony. What does Figure 1 show us?

A. Figure 1 is showing the distribution of categorized programs on average across the different station types as reported in the CDC data. And, in particular, what it shows is the -- the high degree of clustering or high degree of concentration of Claimants' programming, for example and not surprisingly, you know, the bulk of -- or all of the Canadian minutes appear on the Canadian stations, all of the PTV programming appears on the educational stations.

And among the other station types, there is varying degrees of concentration for the other Claimants as well.

Q. Okay. So you're saying that based upon this figure, which shows the breakdown by program category of the programs on the different station types that Dr. Gray had to select from, that the programs are going to vary pretty widely, depending upon which stations he includes in his sample; is that

right?

A. That's correct.

Q. Okay. Now, was each station equally likely to be selected in Dr. Gray's sample?

A. No, they were not. Dr. Gray stratified the stations based on the number of distant subscribers as reported in the CDC data.

Q. And so does he assign a different sampling weight to the stations?

A. That's correct. As part of the stratification process, he assigns a sampling weight to each station.

Q. How did Dr. Gray determine which stations to include for sampling and their sampling weights?

A. Dr. Gray relied directly on the list of distantly retransmitted stations as reported in the CDC data.

Q. So what you've described so far, what kind of sampling design are we talking about that Dr. Gray used here?

A. So, formally, it would be referred to as stratified cluster sampling.

Q. Okay. Now, did you have some issues

with the station list that Dr. Gray relied on; in other words, the sampling frame that he used?

A. Yes, I did.

Q. What were some of your concerns about it?

A. So the -- the issue in the sampling frame, which is the list of stations from which he's going to draw his sample, the issue there is that Dr. Gray created that list directly from the underlying CDC data without any editing of it.

The reason why editing would be necessary is because this list as reported to the CDC depends on the cable operators' reporting of the distant signal. And so there are a number of instances where the identity -- you know, the exact same station is being reported in slightly different ways; for example, you know, with and without a suffix. And having both of those included in the sampling frame, despite being the exact same station, creates an issue.

Q. Well, let's take a look at one of those examples in Figure 4 in Exhibit 2007,

which is page 10 of your rebuttal testimony.

Is the highlighted references under the 2010 column one of those examples you're talking about?

A. Yes. So this is actually in Dr. Gray's sample itself. So a moment ago, I was describing the list, the sampling frame from which he drew his stations. And here is the actual list of the sampled station demonstrating that CBUT-DT, which is identical to CBUT, were both drawn into the sample, despite being the exact same station, because those two different naming conventions were used in the underlying CDC data.

Q. That was the kind of -- that was the same station call sign issue you talked about before when you were talking about merging the FYI and the CDC data together to make sure that the stations aligned, right?

A. Correct. This is exactly the same type of issue, where, you know, I had to work hard to ensure that I was correctly mapping stations from CDC to FYI, yes.

Q. So what's the impact of Dr. Gray allowing duplicate stations to be in his

sample?

A. So the impact of this type of error in a sampling frame would give rise to possible distortions that could create biases in the sample, making the sample non-representative of the population.

JUDGE BARNETT: Dr. Bennett, do you have information about whether CBUT-DT and CBUT, the subscriber numbers, come from the same source? Are they both coming from CDC data or FYI data? Where is that information coming from?

THE WITNESS: So the distant subscribers numbers are a construct of the -- from the CDC.

JUDGE BARNETT: Okay.

THE WITNESS: They created that variable, yes.

JUDGE BARNETT: So is the actual number for CBUT 900,000 or a million, adding those two together? Or is there some screwy overlap that means the number is something other than either one of these numbers?

THE WITNESS: No, there's no overlap between them. So if you wanted to -- you know,

if you were inclined to treat this as, you know, the other stations are being treated, you should add those together.

JUDGE BARNETT: Okay, thank you.

BY MR. ERVIN:

Q. But the programming on both of those stations is identical?

A. That's correct.

Q. Now, based upon your review of Dr. Gray's data, did he have program data for all the stations that he included in his sample?

A. No, he did not. He drew his sample and then identified, you know, or determined whether he had data for those sampled stations.

Q. Let's take a look at Figure 5 in Exhibit 2007. This is on page 10 of your rebuttal testimony. Why don't you describe for us what is here in Figure 5.

A. All right. So Figure 5 is showing the number of stations by year in Dr. Gray's sampling frame, so that's the list that he sampled from. The second -- sorry, excuse me, the third column, sampled stations, is the number of stations that he drew into his

sample, including duplicates. And the final column is the number of those stations for which he actually had airings in program data.

Q. So what's the impact of not having the program data for all those stations he selected for his sample?

A. So the potential impact is, you know, possibly a distortion of, you know, the sampling weights and, again, you know, creating the possibility of introducing biases.

Q. Now, is it your opinion that from what you've seen so far and what we've talked about so far, that it's likely that Dr. Gray's use of cluster sampling with unequal sample weights produced potentially biased samples?

A. I -- so based on the sampling design and the degree to which programs are clustered by station type, there's certainly the possibility of biases being introduced through this process.

Q. Okay. Could Dr. Gray have examined his sample for bias at this point?

A. Yes, he could have.

Q. What information would have been available to him to do that?

A. Well, for example, we know in the population the number of stations by type. So within the population of retransmitted distant signals, we know how many were educational, we know how many were independent.

Based on the sample that's drawn, you can extrapolate from that sample to see whether you match in the population on those types of characteristics.

Q. And did you conduct that exercise?

A. I did.

Q. Let's take a look at Figure 10 in Exhibit 2007, which is page 12 of your rebuttal testimony. Explain for us, Dr. Bennett, what -- what this figure shows from that comparison?

A. So the figure here is looking, in particular, at the educational stations that were retransmitted in each year. It shows, by the blue bars, the proportion of all retransmitted stations that were educational.

And then the green bars are the proportion that Dr. Gray would estimate based on his methodology and from his sample. And the results here are showing that Dr. Gray's extrapolation would be biased downwards for the

educational shares, and here I mean by the share of educational stations, they would be biased downward in 2010, '11, and 2013 and then biased upwards in 2012.

JUDGE STRICKLER: Excuse me, sir. You used educational stations to make your point. Was that by way of example or is that the only category in which it occurred or you don't know?

THE WITNESS: I -- I looked at more than just the educational stations. The educational station to me was the most prominent example to look at because of the one-to-one mapping between the categorization of programs and the station type.

So for educational stations, it is the only place where you're going to find PTV programming.

JUDGE STRICKLER: But you said you looked in the other categories as well and the biased was not as pronounced?

THE WITNESS: I looked at other categories and the bias -- I also looked at the independent stations and the share there as well. And there the bias is also pronounced

there.

JUDGE STRICKLER: As pronounced as you show in Figure 10 for educational stations?

THE WITNESS: We can --

MR. ERVIN: We can take a look at it right now, Your Honor. That was going to be the next figure, Figure 11.

JUDGE STRICKLER: If it's already in the report for sure, yeah, let's go to that.

BY MR. ERVIN:

Q. As Judge Strickler just asked and as you were referencing, independent stations, is this a representation of your comparison for independent stations in Dr. Gray's sample?

A. Yeah, that's correct. So this is the analogous exercise, now asking, you know, based on the shares of independent stations whether, you know, Dr. Gray's sample or, excuse me, extrapolating from Dr. Gray's sample, using his methodology, you arrive at the same point or the same proportion as in the population.

And here we see in contrast to the educational stations that Dr. Gray's extrapolation for the share of independent stations is biased high in 2010, biased high in

2011, and biased high in 2013. And then in 2012 it's biased low.

Q. Okay. So based on what we've seen so far, Figure 10, the educational stations, and Figure 11, what type of programming is more predominant on independent stations, what's featured here in Figure 11?

A. This would be Program Suppliers.

Q. Okay. So in Figure 10, we were talking about PTV category of programming; in Figure 11, we were talking about potential impacts on Program Supplier category of programming. What's the potential impact of over- or under-sampling?

A. Can I just add something to my previous?

Q. Oh, yeah, sure.

A. So this -- you know, this bias -- these biases here would impact not only Program Suppliers but other Claimant minutes as well.

Q. Yeah, actually, that's a good point. Why don't we spend a minute there.

So when we're talking about having less than what is representative in the calculation or more, it's not just the type of

programming we're talking about here that's impacted by that; is that what you are saying?

A. Yeah, but it's also the fact that if you're -- these are shares. So if you've over-estimated one share, you must, by definition, have under-estimated on another share.

So this is just -- you know, there are definite biases that are introduced here by this.

Q. Okay. So that on these two figures and thinking about the over- and under-sampling, what's the potential impact on that sampling by station type that Dr. Gray does here?

A. Can you repeat the question?

Q. Sure. So you've described these, at least these two examples, right, where there's -- you see over-sampling and under-sampling. What's the potential impact of that on the estimations that Dr. Gray makes?

A. Right. So in terms of program shares, the clearest, I think, example would be the -- you know, for example, the PTV minutes, the PTV programs. They're -- they only appear on the

educational stations.

So if you overestimate educational stations or the share of educational stations, you're going to overestimate the share of PTV programming. If you underestimate the share of educational programming -- excuse me, stations, you're going to underestimate the share of PTV programming.

Q. Okay. Let's talk a little bit about precision observations that you've had -- you've made, and take a look at Dr. Gray's Table 1, which is in Exhibit 6036, which is on page 16 of his direct testimony.

Now, this is Table 1, where the levels and shares of retransmissions and volume are presented by Dr. Gray; is that right?

A. That's correct.

Q. And now, did Dr. Gray estimate the numbers and the shares of programs and program minutes for each Claimant based from his samples?

A. Yeah, that's correct. These are estimates from his samples.

Q. Okay. Now, did Dr. Gray assess the precision of these estimates?

A. Not that I'm aware of. Dr. Gray did not report any measure of precision attached to any of these estimates in his testimony.

Q. Now, were you able to assess the precision of these estimates and calculate -- and make calculations on that?

A. Yes, I was.

Q. Let's take a look at Figure 13 in Exhibit 2007, which is page 14 of your rebuttal testimony. And is this an example of one of the margins of error calculations you made on those estimations that were in Table 1 of Dr. Gray's direct testimony?

A. Yes. So Figure 13, the calculations that I performed first reproduced all of Dr. Gray's estimates of the program shares. And I supplemented that calculation with the precision attached to those estimates. And here precision is measured by the margin of error at the 95 percent confidence level.

Q. And -- but, functionally, like practically, how do you make those sorts of calculations? What do you use?

A. The -- so the statistical software that Dr. Gray used to calculate his shares, I

provided that software with the information about his sampling design, and the statistical software is, you know, preprogrammed to output these types of precision measures.

Q. Okay. So once you provide the sampling design -- which I think you called earlier stratified cluster sampling; is that right?

A. That's correct.

Q. And then it produces these estimations, these margins -- the calculations of margins of error; is that right?

A. Yes, that's correct.

Q. Okay. Now, can we compare your calculations that you made to the sampling issues to the shares? And that's what we're doing here with your Figure 10 and your Figure 13.

A. Yes. So this is back to the earlier comments I made about the likely bias in shares arising from the non-representativeness of Dr. Gray's sample by station type. So what's -- what's being illustrated here is, back in Figure 10, it was clear that in 2010, 2011, and 2013, that Dr. Gray's sample and the

extrapolation from it was biased low; whereas in 2012, it was biased high.

If we look at the column in the figure below in Figure 13 and walk down the estimates for PTV and we see 24.48, 22.1, and then in 2013, 26.93, these are in stark contrast to the 40.14 that's reported in 2012.

And that pattern is entirely consistent with the biased low, biased low, biased high, biased low pattern that's established in Figure 10.

Q. Let's talk a bit about Dr. Gray's methodology, sort of what he -- what he's doing in his distant viewing methodology.

Now, do you understand that Dr. Gray was taking what data he could get from Nielsen and then calculating an estimation of distant viewing based upon a comparison of local to distant viewing in the data that he had?

A. Dr. -- yes, so Dr. Gray had available to him a sample of distant viewing for a small share of the quarter-hours that were of interest to him in his analysis. Dr. Gray constructed an econometric model to estimate the distant viewing where it was unavailable in

the original records he was provided with.

And he also ultimately used that same model to not only impute the records for where he didn't have any, but he also used that same model to impute records that were already available to him in the Nielsen data.

Q. Okay. Let's talk about the data first. So what distant viewing data from Nielsen was Dr. Gray provided?

A. Dr. Nielsen -- sorry, excuse me -- Dr. Gray was provided with household counts for some of the stations and quarter-hours in his database.

Q. And by "some," do you mean less than 7 percent of what was in his sample?

A. That is correct. In every year, it was less than 7 percent of the records.

Q. Now, did Dr. Gray determine whether the distant viewing data he received from Nielsen was sufficient?

A. My understanding of his report, you know, given that Dr. Gray took it upon himself to impute records where he didn't have them, is -- is that Dr. Gray himself did not feel he had adequate data to perform his share -- distant

viewing share calculations.

Q. So does he say that he doesn't have sufficient data of the distant viewing to rely only on the distant viewing data that he had? Is that right?

A. That was a little tricky.

Q. I'm not trying to be tricky.

A. No, no, I know. Can you repeat that?

Q. Sure. I was just -- I'm just asking about the sufficiency. Does he say in his testimony that he doesn't have enough distant viewing data to use just that information?

A. I don't recall that exact language in his report.

Q. Okay. So -- so what he -- let's talk about what he does.

A. Um-hum.

Q. So after he makes that determination, how does he try to calculate the level of distant viewing?

A. So this is back to the econometric model for -- so Dr. Gray builds an econometric model purportedly capturing the relationship between local viewing and distant viewing. And it's based on the records that he had available

to him in the -- from Nielsen.

In addition to that, where he didn't have data from Nielsen, Dr. Gray first imputes zeros for those records. And so for his econometric model, when estimating this relationship, it's based on data from Nielsen and, more often than not, zeros that he imputed. Based on the relationship estimated from that data, so both the Nielsen records and his own imputed values, Dr. Gray, you know, based on that estimated model then imputes records, so these are estimates coming out of that model, for each and every record.

Q. Okay. Let's break it down. Let's talk about the data first.

A. Um-hum.

Q. Let's look at Figure 16 in Exhibit 2007, which is page 18 of your rebuttal testimony. Would you describe what's represented here in the summaries.

A. So this is a summary of the total programming by quarter-hours in Dr. Gray's database by -- by year. So it's always north of 4 million quarter-hours.

And the Nielsen -- the Nielsen data

that's provided to Dr. Gray is at the quarter-hour level. It's a count of households at a given quarter-hour.

Now, the percent with no distant viewing record, that's showing that for more than 93 percent of the quarter-hours in his database, Dr. Gray had no record of distant viewing from Nielsen. And the far column on the right shows that, in addition to having no distant viewing records for many of the quarter-hours, Dr. Gray was also without local viewing records for more than, you know, 58 percent of those records in any given year.

Q. And in your opinion, does that introduce the potential for uncertainty in the estimations that are based upon that level of data or that -- that lack of level of data?

A. Any analysis that would be based on, you know, a calculation where more than 90 percent of records are imputed would, in my opinion, be imprecise and -- yeah.

Q. Let's take a look at Figure 17 in Exhibit 2007. This is on page 19 of your rebuttal testimony.

So this looks like a representation of

the data but just broken down. Could you describe this, please?

A. So this is showing the data that Dr. Gray included in his regressions. So if you remember, Dr. Gray is purportedly, you know, estimating the relationship between distant and local viewing.

Now, these are the -- these are the counts of records that he included in his regressions. In 2010, for example, nearly 1.8 million records that are included in the regression have no observation for either local or distant viewing.

Q. In the Nielsen data that he got?

A. Yes, the Nielsen did not provide him with any records for those quarter-hours.

Q. Okay. And you mentioned before that he replaced those no observations with zeros; is that right?

A. That's correct. For the distant -- the counts of distant households, Dr. Gray first replaced missing with zeros before estimating his model.

Q. Now, were you able to determine, from your review of the files and the materials,

whether the zero came on the Nielsen-provided information or the zeros were provided by Dr. Gray?

A. There were -- there were no zeros, zero counts of households. The Nielsen data for household counts was, you know, a positive number or there was no record.

Q. Okay. Now, do you agree with replacing the zero counts -- or the no observations with zero?

A. For this purpose, I do not agree with this replacement. Here Dr. Gray is, you know, estimating a model where he imputes a zero, only later to, again, impute the value using a prediction out of that model.

And either the zero is correct, in which case there's no point for the imputation, or the zero is incorrect and you've introduced incorrect data to inform the regression model, which invariably would bias the results.

JUDGE STRICKLER: I have another question for you with regard to Figure 17 that we're looking at.

In the third row, it says missing distant "no" and missing local "yes," is that

the one where he had distant data but replaced it and imputed it with numbers that he got from his regression?

THE WITNESS: So the third row, he's missing distant. He does impute those records based on his regression results. And --

JUDGE STRICKLER: In the third row, he's not missing distant, right?

THE WITNESS: Oh, excuse me, I'm sorry. I misread that.

So, yes, so the missing -- in the last -- in the third column, he has those distant records, but --

JUDGE STRICKLER: Third row, you mean?

THE WITNESS: Yes, sir, excuse me. The third row, he has distant records, but he does replace those with the imputations, with the estimates from his regression.

JUDGE STRICKLER: That's the replacement of spoke of earlier in your testimony?

THE WITNESS: That's correct.

JUDGE STRICKLER: Thank you.

BY MR. ERVIN:

Q. Now, Dr. Bennett, did you examine

Dr. Gray's imputed measure of distant viewership and compare that against the viewing records provided by Nielsen for specific stations included in Dr. Gray's sample?

A. Yes, I did perform that type of analysis.

Q. Let's take a look at Figure 19, which is in Exhibit 2007 on page 22 of your rebuttal testimony. Please describe what this shows us.

A. So Figure 19 is a comparison of distant viewing household quarter-hours based on information in the Nielsen data, so that would be the column Nielsen. It should be Nielsen. Those -- so there was no -- for this particular station, there was no record of any distant viewing in any of the 2010 to 2012 period. 2013, the station wasn't sampled, so that's not included here, but for 2010 to 2012, there was no information.

And so in terms of counts, from no information, I just reported there were no records, zeros here. In contrast, from Dr. Gray's imputation, there are fairly large counts of -- you know, of viewing based on his imputations.

Q. Let's take a look at Figure 20 in Exhibit 2007, which is page 23 of your rebuttal testimony. Does this one show a different scenario when you compare the Nielsen observations against Dr. Gray's estimations?

A. Yes, so here in Figure 20, what it's showing is that the counts of distant viewing household quarter-hours is, in fact, quite a bit higher in the underlying Nielsen data than what Dr. Gray produces through his imputation methodology.

So, in other words, for this station, viewers or counts of households by quarter-hours are actually being eliminated relative to Dr. Gray's or by Dr. Gray's imputation.

Q. So is it your view that this, you know, less than what -- more than what was actually observed and then maybe even less than what was actually observed scenarios creates further uncertainty into the imputations that are made by Dr. Gray?

A. Yes, you know, to me certainly, there's no basis for eliminating records, you know, from the underlying data. It's -- it's

also the -- you know, here an instance where you're actually below what you started with. You know, presumably, you're -- there are also instances where you're above. It's not clear, you know, in terms of like the biases, what this would introduce to the -- to the final calculations or the ultimate calculations.

Q. Okay. Let's take a look at Figure 22, also in Exhibit 2007, which is page 24 of your rebuttal testimony.

Now, does this aggregate show sort of a roll-up, if you will, of what you just showed us in the first two figures for all of the stations that were included in Dr. Gray's sample?

A. Okay. So Figure 22 is summarizing the impact that the imputation has on shares of the distant household quarter-hours. And it's -- so this would be, you know, Nielsen records relative -- so the shares based on the Nielsen records relative to the shares based on Dr. Gray's imputation.

And it's showing that the shares based on Dr. Gray's imputation fall for the Canadian CTV and the PTV Claimants in 2010. You know,

in 2010, the CTV shares fall by 11.23 percent, you know, relative to what was actually reported by Nielsen. In contrast, again in 2010, Program Suppliers go up by nearly 12 percent relative to what was actually reported by Nielsen.

Q. Okay.

JUDGE BARNETT: Dr. Bennett, Nielsen doesn't categorize, does it, by Canadian, Commercial TV, Devotional? That's something that the economists do when they receive the raw Nielsen data?

THE WITNESS: That's correct. So --

JUDGE BARNETT: Okay. So how do you know which -- what the differences were by category? Is that by comparing to how you categorized them versus how Dr. Gray categorized it, or how did you come up with these comparisons?

THE WITNESS: Right. The -- the figure here is based on Dr. Gray's categorization, and it shows that had Dr. Gray extrapolated -- so, again, the counts are by program quarter-hour. And to each of those programs, Dr. Gray has his categorization of

that program.

And so this is showing, had Dr. Gray extrapolated and calculated shares directly from the Nielsen data, what he would get relative to what he gets based upon on that same extrapolation but using now his imputed values.

JUDGE BARNETT: Okay. His categorization?

THE WITNESS: Correct.

JUDGE BARNETT: No comparison to the categorization you did?

THE WITNESS: That's correct.

JUDGE BARNETT: Okay. Thank you.

JUDGE STRICKLER: I have another question, just something I want clarified. I think I get it from paragraph 65 of your rebuttal report on page 23, explaining Figure 22 that you're looking at. We have the percentage changes. Those are percentage point changes rather than percentage changes; is that correct? In other words --

THE WITNESS: These are percentage point changes, that's correct.

JUDGE STRICKLER: Right. So, in other

words, if -- if one version had 22 percent for Program Suppliers and another one had 33 percent for Program Suppliers, when you corrected for his mistake, that would be an 11 percentage point -- and that's what you reflect, the change, and that's what you're reflecting here, that wouldn't be a 50 percent change.

THE WITNESS: Correct, correct. It's percentage point change.

JUDGE STRICKLER: Thank you.

BY MR. ERVIN:

Q. Let's look at your last point that we mentioned, the concerns regarding the lack of precision. And take a look at Dr. Gray's Table C-5, which is in Exhibit 6036. This is on page 39 of Dr. Gray's direct testimony.

Dr. Gray indicates here that his viewing share results have pretty tight intervals and were quite precise. Is that an accurate reading of Table C-5?

A. I would interpret confidence intervals that are this narrow as precise.

Q. Confidence intervals, for example, in 2012 on the Program Suppliers of between 36.0

and 36.34, just as an example, pretty tight?

A. That's a very precise estimate.

Q. Okay. In your opinion, are these calculations accurate?

A. They are not accurate.

Q. Why are Dr. Gray's calculations at the 95 percent confidence intervals in his regression not accurate?

A. These calculations or Dr. Gray's calculations of these confidence intervals ignore several important sources of uncertainty. First of all, these are calculated assuming that Dr. Gray had used simple random sampling of programs by quarter-hour, when, in fact, Dr. Gray had himself designed a sample which was stratified cluster sampling.

Additionally, these calculations here assume that the imputed values of distant household viewing are -- are accurate and known with certainty; in other words, that there's no uncertainty about those values.

Q. Now, did you recalculate the precision estimates here yourself?

A. I -- yes, I recalculated confidence

intervals, taking into account the sampling design that Dr. Gray relied on.

Q. Let's take a look at Figure 23 in Exhibit 2007, which is page 25 of your rebuttal testimony.

And are these those recalculations including the stratified cluster sampling effects?

A. Yes. These calculations -- and, again, here, it's similar to my prior calculations for the program shares. These -- this table reproduces Dr. Gray's estimated shares, and it also incorporates the margins of error based on, you know, the standard errors in precision estimates that come from informing the statistical software of the correct sampling design, which is stratified cluster sampling.

Q. Okay. Let's take a look at Figure 24, also the same page there in Exhibit 2007. And is this an expression of those -- of the confidence intervals providing the ranges based upon your calculations?

A. Yes. These are the confidence intervals that arise from taking Dr. Gray's

point estimates and adding and subtracting the margin of error as calculated in Figure 23.

Q. Why don't we compare this, Figure 24, to Dr. Gray's Table C-5, which is in Exhibit 6036, and put them together. And let me ask you to compare them if you would, please.

A. So Figure 24 here, which takes account of the use of stratified cluster sampling, so taking account correctly of Dr. Gray's sampling design, the confidence intervals are no longer precise or as precise as Dr. Gray had in his table.

For example, if we look at, you know, Program Suppliers in 2012, you know, the range is from 27.46 percent up to 44.82 percent. You know, so this is a 17 percentage point swing as opposed to the 36 percent to 36.34 percent range that was reported by Dr. Gray.

Q. Now, the recalculation you did on the margins of error in the confidence intervals that you produced, that incorporated the sampling design, right, the cluster, the stratified cluster sampling; is that right?

A. That's correct.

Q. Do these wider confidence intervals in Figure 24 account for the uncertainty you were talking about before in the estimation of the distant viewing that was done based upon the Nielsen records?

A. No, these confidence intervals that I calculated here do not incorporate the additional uncertainty introduced by Dr. Gray's imputation.

Q. And if you were able to do that, do you believe that the confidence intervals in Figure 24 would be even wider?

A. The statistical literature affirms that the confidence intervals could only be wider by introducing that additional source of uncertainty.

Q. Okay. So let me try to apply the three issues we just reviewed and that you just provided some context for to what seemed to be the two principal steps in Dr. Gray's direct testimony in his study.

And the first one involves his estimation of Claimant programs, Claimant program minutes. And then the second one is this distant viewing by Claimant imputations,

right?

So, first, would it be accurate -- do you believe it's accurate to say that Dr. Gray needs a sample that is representative by station type in order to obtain unbiased estimates of Claimant program and viewing shares?

A. Yes, I do.

Q. And do you believe he accomplishes that?

A. No, I do not.

Q. The second step, his imputation method, right? In order to be reliable -- would you agree that, in order to be reliable, his distant viewing share estimates, which are in Table 2, which are based on his imputed values in order to be reliable, there needs to be a reliability in the underlying method? Would you agree with that?

A. I would -- I would say that Dr. Gray's econometric methodology for imputing distant household records is unreliable.

Q. Based upon your review and your chance to examine the materials as well as Dr. Gray's study, do you have an opinion about whether

Dr. Gray's distant viewership study reliably measures relative distant viewing -- distant program viewership?

A. It is my opinion that Dr. Gray's study of distant viewership produces biased, imprecise, and unreliable results.

Q. Thank you, Dr. Bennett. We have no further questions at this point.

JUDGE BARNETT: Mr. MacLean?

CROSS-EXAMINATION

BY MR. MacLEAN:

Q. Good afternoon, Dr. Bennett. I'm Matthew MacLean and I represent the Settling Devotional Claimants.

A. Good afternoon, Matt.

Q. So I want to clarify just a little bit. Well, first, let me see if I can clarify this: The Nielsen DMA ranking, if this refreshes your recollection, is it done by number of households in the -- television households in the DMA? You don't remember?

A. I don't recall.

Q. Okay. No problem.

With regard to your categorization of whether programming is compensable or not

compensable on WGN, or that is to say compensable or non-compensable on WGNA, as I understand it you took your FYI database; it was just a side-by-side comparison. If it was on WGN and WGNA at the same time, it's compensable; if not, it's non-compensable. Is that right?

A. If the program appeared on WGNA simultaneously -- and simultaneously on WGNA, that the program on WGNA would be flagged as compensable.

Q. In your observation of the database, were there times when the WGN database and the WGNA database -- you know, maybe one was showing as-aired, one was showing as-scheduled, something -- anything like that? Or did you not analyze that?

A. I'm not aware of one way or the other, if that were the case.

Q. If it -- if it were the case that one was showing as scheduled and then there was something that caused a shift in as-aired that was reflected on the other one, would your -- would your categorization have correctly captured whether it was compensable or not

compensable?

A. So my understanding from the FYI -- of the FYI data is that it's updated to reflect, you know, preemptions and other, you know, changes to the schedule.

Q. Did you find any circumstance on WGNA of non-compensable either sports or commercial television programming?

A. I don't recall the -- I don't recall all of the programs, you know, specifically by whether they were compensable or not. The -- you know, the algorithm was designed and the review was designed to look at overlapping or simultaneous airing or not.

I didn't spend as much time studying, you know, each instance and the type of programming.

Q. Let me ask now, a different topic, about your preparation of data and analyses for Dr. Crawford's use. Okay?

Did you -- did you actually run the regressions that Dr. Crawford would ask to be run or did he run his own regressions?

A. Staff at Bates White that supported both Dr. Crawford and I would run regressions.

In particular, Dr. Julian Chan, who is a Ph.D. economist and also an econometrician by training, was doing the heavy lifting on all the econometric analysis in terms of the computational implementation part.

Q. So Dr. Chan would be the one who would run, if there was a regression run, it would be Dr. Chan who ran it?

A. It would -- my understanding is that, yes, if Dr. Crawford wanted a regression run, that he would coordinate with Dr. Chan to do that.

Q. Is it Chan or Chen?

A. Chan, C-h-a-n.

Q. Thank you. Was Dr. Chan working under your supervision or was this sort of a -- separate from your supervision?

A. So Dr. Chan supported both Dr. Crawford and myself, so with, you know, portions of my analysis on categorization, et cetera. Dr. Chan would also be someone that I could turn to for help.

Q. Did you personally provide support for Dr. Crawford's analyses?

A. Dr. Crawford and I, you know, did

speak at various times. I would characterize my involvement there as acting as a sounding board in some instances.

Q. I understand from your testimony just now that a lot of your experience and expertise has been in the area of bootstrapping. Is that right?

A. Yes. I think maybe with the exception of one of my research papers, all of my research has involved to some degree the use of bootstrap methods.

Q. Bootstrap methods are among the methods that could be used to evaluate over-fitting in a regression model; is that right?

A. What do you mean by over-fitting in a regression model? Do you have context in mind?

Q. Do you know what over-fitting means?

A. Well, it -- I do in certain contexts understand what over-fitting is, but just to be clear, the literature is quite broad in statistics in general. So like many concepts in statistics or econometrics, the -- there can be variations on one's use of a term from -- you know, from one literature to the next.

As an example, just identification in econometrics or statistics, there's papers written on just what that term means for different people in the field.

Q. To your knowledge, did Bates White run any -- any tests on Dr. Crawford's regressions for the purpose of determining whether or not they were over-fitted in any definition of that word?

A. I'm not aware of -- I'm not aware of a test for over-fitting, no.

Q. To your knowledge, do you know how many regression models were run by Bates White at Dr. Crawford's requests before finalizing a model that was presented in Dr. Crawford's report?

A. I -- I don't know. I can say more than one, but I don't know how many. And just for context there, the -- the use of subscriber group information was -- and the availability of that information was something new, and I know that, very early on in the case, there had been a regression run not using subscriber group information.

Q. So there was -- early on, before

finalizing a report, there was a regression run that used system level information; is that right?

A. Yeah, I believe that the -- at the outset of the project, yeah, there would have been a regression run, I think at the system level.

Q. Okay. So that was -- you said that you think it was more than -- there was more than one. Was that one of the regressions that were run before finalizing a regression model that went into the report?

A. Yeah. So I would imagine that more than one regression was run. You know, as I described in my testimony, the process on my side as the -- you know, the person responsible for categorizing data, you know, and ensuring that that's done appropriately, if I were to make a correction of the data that would necessitate rerunning a regression --

Q. I really meant more in terms of different regression models. For example, at the system level and at the subscriber group level, it would be two different models. Would you agree with me?

A. Yes.

Q. Yes. And besides -- aside from those two models, were there other -- were there other models run in which there were changes made in the variables included or excluded? To your knowledge?

A. Yeah, I imagine there were more models.

Q. Don't imagine. I'm not asking you to imagine.

A. Okay.

Q. I can imagine it but --

(Laughter.)

BY MR. MacLEAN:

Q. If you could just stick to what you know.

A. I -- I don't know how many regressions were run or not. I think that would be, you know, a question for Dr. Crawford. As I described earlier, you know, the process was, you know, I am -- I'm the data guy. If you have a question about the data and the understanding of a variable, I can help with that.

Dr. Chan was, you know, running a

regression at the request of Dr. Crawford.

Q. Would you be copied on e-mails between Dr. Chan and Dr. Crawford about regressions?

A. In some cases, yes.

Q. Including e-mails that included regression results?

A. In some cases, yes.

Q. Do you still have those e-mails?

A. I don't know one way or the other.

Q. Do you typically delete your e-mails from time to time?

A. I'm not very good at deleting my e-mails.

MR. MacLEAN: No further questions. Thank you. Thank you, sir.

THE WITNESS: Thanks.

JUDGE BARNETT: Cross-examination? How much do you have, Mr. Olaniran? How much, how long do you anticipate?

MR. OLANIRAN: Half hour, it depends. Half an hour?

JUDGE BARNETT: Let's take our afternoon recess, please, 15 minutes.

(A recess was taken at 2:46 p.m., after which the trial resumed at 3:06 p.m.)

JUDGE BARNETT: Please be seated. Mr. Olaniran?

MR. OLANIRAN: Thank you, Your Honor.

CROSS-EXAMINATION

BY MR. OLANIRAN:

Q. Good afternoon, Dr. Bennett. My name is Greg Olaniran, and I represent Program Suppliers.

A. Good afternoon, Greg.

Q. And I just have a few questions for you.

With regard to your program categorization, you used an algorithm to assign programs to categories used in this proceeding, correct?

A. I used an algorithm as outlined in Appendix D of my written testimony.

Q. And your algorithm applied to the entire database of U.S., Canadian, and Mexican broadcast channels based on data that was provided by FYI, correct?

A. I believe the algorithm categorized all of the broad -- all of the programming on the broadcast stations in the -- in the database.

Q. Can you just speak up a tiny bit, please.

A. I believe that the algorithm and the categorization applied to all of the airings data for broadcast stations.

Q. Thank you. And you are familiar with Dr. Gray's categorization also, are you not?

A. I'm familiar with Dr. Gray's categorization to -- to the extent that I examined it for discrepancies and miscategorizations.

Q. Are you familiar -- did you look at his algorithms for program categorization?

A. I did, yes.

Q. Okay. But his algorithm was applied to samples of stations based on data provided by Gracenote, correct?

A. Dr. Gray relied on Gracenote data in his analysis and in his categorization, that is correct.

Q. And did you review Dr. Gray's rebuttal testimony? It should be Exhibit 6037. It should be -- is it there?

A. Can I get a copy of it just to confirm?

Q. Do you see a green binder next to you, on the floor?

A. You said a green binder?

Q. Yes.

A. Or a green cover?

Q. A black binder with a green cover.

A. There, there we go. Oh, it's heavy.

JUDGE BARNETT: Welcome to our world.

(Laughter.)

THE WITNESS: Okay.

BY MR. OLANIRAN:

Q. Let's go to Exhibit 60 -- actually, it should be on your screen, if that's better for you to handle.

A. That's better, yeah.

Q. And have you seen that table before? It is Table 9 on page 21.

A. Just give me one second. Distant viewing shares, yes, I do recall seeing this table, yes.

Q. And do you understand what Dr. Gray is presenting in Table 9?

A. Yes, I believe I understand what Dr. Gray is presenting in this table.

Q. And do you agree the third column is

original classification of viewing shares based on his algorithm for program categorization; do you understand that to be the case?

A. That's my understanding, yes.

Q. And then in the last -- in the -- on the last column, he is doing the same thing, except this time he is using an algorithm. Do you see that?

A. I -- yes, I see that he's using -- I see the numbers that are presented. I did review this analysis.

And what Doctor -- the shares that Dr. Gray are presenting here are based on my original categorization prior to the corrections that were -- that I completed and submitted as part of my amended testimony.

Q. Which --

A. To be clear --

Q. Which data? I mean, which date amended testimony?

A. I believe that would have been in April 2017.

Q. Okay.

A. So these don't --

JUDGE STRICKLER: And that's amended

rebuttal testimony?

THE WITNESS: My amended direct. So these share calculations do not include the recategorizations that were made as part of the correction to my categorizations. So neither patch A nor patch B are reflected in these shares.

BY MR. OLANIRAN:

Q. Excuse me one second. Now, let's go to Exhibit -- to your rebuttal testimony, the one that was filed on September 15th. That's Exhibit 2007.

And let's start with Section VI.A, the discussion from Section -- from page 18 floating over to page 19.

Just a couple of questions. This is a follow-up to the exchange that you had with Mr. MacLean a few minutes ago.

You didn't run any of the regressions requested by Dr. Crawford, did you?

A. So I'm not sure that that is a correct characterization of what I said earlier. So Dr. Chan is supporting both Dr. Crawford and myself. Dr. Chan is the one who Dr. Crawford would rely on to -- to run the regressions.

Q. So the answer to my question is, no, you did not?

A. Can you repeat the question?

Q. My question -- I promise it is not a trick question -- my question was whether or not you ran any of the regressions requested by Dr. Crawford?

A. No.

Q. And you referred to yourself as the data guy. Does that mean that you didn't run any regressions, you didn't run any regressions at all?

A. No, I ran regressions. The analysis that was done by Dr. Gray and the analysis of his underlying materials, I took that upon myself to do that analysis. So I -- I reran Dr. Gray's regression.

Q. You replicated his regression?

A. I replicated -- I reran his code on the data that he provided, yes.

Q. So does that mean that you have replicated his coefficients?

A. The only reason I'm hesitating is I don't recall if there was any replication issue. So, to the best of my knowledge, I was

able to replicate, I think it was all except for one set of coefficients for one year exactly.

Q. Were you able to replicate his results for the most part?

A. For the most part, yes.

Q. And how often do you work with regression analysis?

A. More often than I would like.

Q. How often is that?

A. So in my role at Bates White, a lot of what I do is oversee and review, you know, analyses done by other, you know, junior consultants. That often involves me, you know, running regressions.

You know, if I don't have -- just to be clear, if I don't have a Dr. Chan running my regression, then likely it is going to be me doing something like that on another case.

Q. So how often would you say? Once a week, you know, once a month?

A. It's -- so I would put it this way: It is not every day, but some days it is all day. And I haven't taken it upon myself to think carefully about how to quantify that.

Q. Okay. And have you ever worked with Nielsen viewing data at all before this proceeding?

A. Prior to this case I don't recall doing any detailed analysis directly, analyses directly with Nielsen data, other than seeing summaries and charts and things like that.

Q. Okay. So do you have any idea what portion of all viewing is distant viewing?

A. In terms of counts of households, or --

Q. Yes.

A. I -- I do not know. No, I haven't taken it upon myself to do any analysis of, you know, household counts of viewership outside of what I have seen in this matter here.

Q. Okay. What about in terms of quarter-hours, do you know what portion of all program quarter-hours is distant quarter-hours?

A. I have not done an independent assessment of that, nor do I recall what those figures are.

Q. Now, as I started to ask you a couple of questions about Section VI.A, that is pages 18 and 19, and so let me get to that.

Just a quick question. On figure 17 on page 19, are you there?

A. Yes.

Q. Okay. What metric is that? Is it quarter-hours, number of programs, or --

A. These are counts of quarter-hour records in Dr. Gray's regression database.

Q. And in paragraph 53, and you talk about the fact that Dr. Gray tops his regression data by replacing missing distant and local viewing records with zeros, right?

A. I do discuss that, yes.

Q. So the first point is that -- your point is that there is a bunch of zeros in the records that Dr. Gray obtained from Nielsen -- or, actually, let me -- let me strike that and go back.

Your premise is that there is a lot -- there is missing data from the data that Nielsen and Dr. Gray received from Nielsen; is that correct?

A. The fact, these are -- so in figure 17, these are just actual counts of whether they are missing or not, you know, for -- so we can read from the table directly how many

records, quarter-hour records in Dr. Gray's database were without any Nielsen distant viewing record.

Q. Okay. I just wanted to make sure I understand what you mean by missing. By missing, are you -- are you saying that the record is somewhere and it has not been presented or that there is no recorded viewing?

A. So what I mean by that is that if your -- you know, so where it is marked as missing here, there is no -- so when there is a record in, let's say, at, you know, 2:00 o'clock on Thursday on a particular date in a particular quarter-hour, if there is that time and that quarter-hour and a household record and number, that would be a, you know, a non-missing.

If I look and it says, you know, 3:00 p.m., 3:15, and then it goes to 4:00 o'clock, and there is nothing there, that's missing.

Q. Okay. Again, my question is when you say missing, are you saying that the record exists and it has not been presented or are you saying there is no recorded viewing? Do you understand the difference?

A. I understand my interpretation of

missing to mean that if I go down the list and there is nothing there, that that's missing, and then there is something.

Q. I understand what you are saying. My question is, are you making a distinction between a record that exists that is not being presented versus a quarter-hour where there just simply was no recorded viewing?

A. I don't know whether that record exists anywhere. If I understand -- maybe you can restate your question.

Q. My question is whether or not -- what would you expect to see, if in a quarter-hour there was no recorded viewing, let's say nobody watched, what would you have expected to see in that quarter-hour?

A. I would expect that if there was zero viewing, that there would be a zero recorded.

Q. Okay. This is from your familiarity with Nielsen data or is this just your general impression? I'm sorry, strike that.

Is this from your familiarity with -- well, what is your basis for that, for that understanding?

A. For my understanding that if it were

truly zero, that they should -- that I would expect to see a zero?

Q. And what is the basis for that, for that statement?

A. That would be -- I don't have -- so it would -- it would be my understanding that if there is truly a zero, I would expect to see a zero.

I'm not making -- just to be clear, I'm not relying on this data for any analyses.

And to the extent it is missing, I'm not imputing a zero or not. But I would, you know, that would be my expectation with data is that when there are zeros and a known number, that they get entered.

Q. But you haven't had any interaction with Nielsen data in this kind of detail prior to this proceeding?

A. No, I have not.

Q. And so you wouldn't know, for example, if no information in a particular quarter-hour means no viewing?

A. Well, what I do know is that it is not zero and not zero as was done in this analysis here.

Q. So your answer to my question is, no, you would not know, correct?

A. I don't know what the true value is, but it can't be two different values at the same time. That's -- that's what I know about the data.

Q. Well, what do you mean by it can't be two different values?

A. Well, if I were to impute zero as a value to rely on in a regression, and then I replaced the zero with a different non-zero value, I have implicitly assumed that there are two different values for that record that are both correct, which just can't be right.

Q. I am trying to determine if I really understand your answer or not. And I am trying to make this question as simple as possible. So bear with me.

You have never worked with Nielsen data in this manner before, in this detail before, correct?

A. That's correct, I haven't worked with this Nielsen data before.

Q. So if -- if the quarter-hours with no information, if Dr. Gray received the

quarter-hours with no information in inserting quarter-hours in those -- with no information in those quarter-hours, you are interpreting that -- those -- the lack of information as missing data, correct?

A. Can you repeat that one more time?

Q. If Dr. Gray received data from Nielsen in quarter-hour format and there are quarter-hours with no information, it doesn't say zero, there is no value in it, just empty, right, are you interpreting that data as missing, or are you interpreting it as no -- no viewing?

A. I am interpreting that to me as missing in the sense that I don't know what the correct value should be.

Q. Okay. What would you have expected to see if there was, in fact, no viewing in that -- in a particular quarter-hour? What would you have expected to see?

A. I think what I would expect is, for me personally if I were to do this analysis, and if there is zero viewing that is reported to me, that I would interpret that as a zero.

Q. Okay.

A. Otherwise it is not clear to me how to interpret that. That's -- that's what's being conveyed in this table. If it is missing, I as the analyst am unsure as to what the correct value is. It could be zero. It could be a number other than zero.

Until I have confirmation of that, it is a missing record.

Q. Okay. Do you know whether or not Dr. Gray had confirmation before he, as you said, replaced those cells with zeros?

A. If -- if Dr. Gray had confirmation that it was zero, there is no basis for him to then run a regression and estimate a new value which is positive and greater than zero, and then put it in.

Q. Okay. Now, is it fair to say that you are troubled by the extent of the zeros in the records that were provided by Nielsen?

A. No, I don't think that's a fair statement.

Q. Well, what is your -- what is your characterization of the extent to which the record provided by Nielsen contained a lot of zeros?

A. So to be clear, what I have assessed here is the count of records or the count for which there was no numeric value provided from Nielsen. I don't know if they are zero or not, and I haven't characterized them as, you know, the extent of zeros.

Q. Well, you, and going back to page 18, paragraph 49, you said -- in figure 16, you have a percentage, a percent with no distant viewing record. Do you see that?

A. Yes, I do.

Q. And you listed different percentages ranging from 93 to about 95.

If we assume that that percentage -- those percentages were actually zeros, would that -- would that trouble you as a data analyst?

A. I wouldn't feel one way or the other. I wouldn't be troubled by having data available from which to analyze.

Q. So you don't -- the issue for you is not the fact that there is zero -- that there were no -- there is no information in the quarter-hours; your criticism is that Dr. Gray replaced those empty quarter-hours with zeros,

is that fair?

A. No, that's not quite right.

Q. Okay. Well, tell me what your issue is there.

A. So the issue, as I have laid out in paragraph 50, is that Dr. Gray first replaces more than 93 percent of missing records with zeros, then puts those zeros into a regression thereby estimating a relationship between zero viewing and -- distant viewing and whatever record he had for local viewing.

And then out of that regression, estimating positive viewing and then replacing all of the zeros with positive numbers.

Q. Okay.

A. So to be clear, you are going from an assumption that it is zero into a model which then says that it is not zero, and then relying on the not zero value.

Q. Do you --

A. But what is the basis for estimating a relationship on a number that, you know, for myself, if I was to estimate a relationship based on data that I don't believe to be correct or accurate, that just lacks, I mean,

scientific rigor.

Q. Now, what if you -- let's assume that those, those zeros were actually non-recorded viewing. Would that change your opinion about his analysis?

A. The --

Q. In this particular context.

A. Right. So what that would tell me is that the regression serves no purpose. If I have data from Nielsen that's non-zero, and that every missing record is a zero, there is no need for a regression. I know the values of every record. I performed my analysis based on that data.

And as my analysis -- my testimony, my written testimony shows, we know the impact and the shares based on that analysis.

Q. So you don't think that if -- is it the level of non-recorded -- in my assumption, is it the level of non-recorded viewing or percentage that is your criticism because you say if you have that much non-recorded viewing, that you don't believe there should be a regression. Is that a fair -- a fair statement?

A. If they are known values, you don't need to impute them. There is no -- there is no -- if I -- if Nielsen provided all of the records to Dr. Gray and those records were accurate and reliable, Dr. Gray could have just calculated the shares without resorting to this regression-based imputation procedure.

Q. What is your understanding of what Dr. Gray did in his regression model?

A. As I described a few minutes ago, Dr. Gray started with the regression data set, which is summarized in my testimony on -- in figure 17.

For -- in instances where he did not have a distant viewing record from Nielsen, Dr. Gray replaced those with zero values. Okay?

Now, with that data which is, you know, zeros and positive records, he then put that data into a regression, which then forms the basis for estimating the relationship between local viewing, again, when observed, and distant viewing, which is the zeros that he put in in the remaining, you know, the other 7 or so odd percent of actual records.

So the basis for establishing the

relationship in the regression is the zeros and then the other 7 percent, roughly, of Nielsen actual records.

Q. Do you understand the objective of the exercise overall?

A. Yes, I do.

Q. What is it?

A. The exercise was -- can I get his report? I think he -- he summarizes it quite succinctly.

Q. That will be 6036, Exhibit 6036. Can you --

MR. ERVIN: The green binder.

THE WITNESS: Oh, the green binder.

BY MR. OLANIRAN:

Q. I'm sorry. I was actually trying to get it up on the screen.

A. So which --

Q. 6036.

A. 6036. Yeah, so paragraph 35 on page 17, Dr. Gray writes that "due to the low frequency of distant viewing and the size of the sample Nielsen uses to measure total U.S. household viewing, there are many instances of no recorded distant viewing of compensable

retransmitted programs in the Nielsen household meter data. However, it is possible to obtain reliable estimates of distant viewing for all retransmitted programs by also relying on Nielsen measures of household viewing in each retransmitted station's local market."

This is the paragraph in which Dr. Gray sets out the rationale for his regression analysis.

Q. And is it safe to say that the purpose of the regression analysis was to predict viewing for all of the programs in the sample, correct?

A. Yes, but if you are missing those records, you set -- if you set them to zero and then you use that already-imputed value, which you don't believe to be correct within your regression, you bias your regression, the estimates coming out of the regression are unreliable, and the imputed non-zero values are also unreliable.

Q. I mean, if you had all the record, you wouldn't need a regression in the first place, right?

A. Exactly.

Q. You wouldn't have anything to predict if you had all the records?

A. You wouldn't need to.

Q. Okay. And the regression only comes in when you need to predict information that's not readily available or apparent, correct?

A. Exactly.

Q. You also talked about the fact that Dr. Gray did not -- did not use the actual viewing. And if I recall correctly, your criticism was that he did not replace the values that he calculated with the actual viewing data that came from Nielsen.

Is that a fair way to describe the criticism?

A. So I would characterize the exercise slightly differently. Dr. Gray sets out to impute the records for which he has no distant -- to impute values where he has no distant viewing records. For approximately 7 percent of the quarter-hours in each year Dr. Gray had available to him actual viewing records.

And so his exercise then is, you know, according to him, to impute records for the missing.

Now, what Dr. Gray does, in fact, is he takes from his regression the output, replaces the zeros with that output, but he then also replaces the actual values in the Nielsen data with the estimates coming out from that model.

Q. So, in your view, what Dr. Gray should have done was, after he predicted viewing for all quarter-hours, he should have gone back and taken out the predicted viewing and replaced those predicted viewing with actual viewing where he had actual viewing?

A. That's not what I'm saying.

Q. What are you saying?

A. My opinion is that -- only that Dr. Gray -- what Dr. Gray has done is unreliable. I have not offered an opinion about how Dr. Gray could have or should have done this exercise.

My opinion is limited to the fact that there is no basis for imputing values where he, himself, says they are missing, doesn't believe they are zero, imputing them with a zero, basing a regression analysis on that data which he does not believe to be correct, and then

replacing it with the values coming out of this regression analysis that's based on those incorrect values.

Q. But your words in your testimony is that he supplanted the actual viewing, right, that's what you said, is that right?

A. I did -- I did in my testimony write that he supplanted the actual viewing, yes. He replaced -- he replaced the values that were actually provided to him with those coming out of his econometric model.

Q. I don't think I'm disputing your description of what he did. My -- my question to you is, you were criticizing him for not -- for what you describe as supplanting the actual viewing.

And my question simply is, what would have been the correct way to do it in that particular context? What would have been the correct way, in your view, of what he should have done with the actual viewing?

A. I'm not endorsing the data that he relied on.

Q. I am not asking you about that. I am asking you about his methodological approach.

He used actual viewing to predict, among other variables, to predict entire viewing for all of the sample stations, and did not go back to replace those quarter-hours that have actual viewing. And your criticism is that he should not have done that.

My question to you is, what's the alternative? What in your view was the correct approach methodologically, setting aside your -- your disagreement with data in general, what should have been the correct methodological approach to what Dr. Gray did, in your view?

A. I have not -- I was not asked to develop a statistically-sound methodology for the purpose of calculating distant viewership. But as a starting point I think I would first go back to Nielsen and get clarification about the missing records.

Q. Do you know whether or not Dr. Gray did that?

A. I only know what's in Dr. Gray's testimony and what I have stated about the -- the unreliable nature of -- of this analysis.

Q. Did you read the testimony of Mr. Lindstrom?

A. I did review his testimony at the time I was doing this analysis.

Q. And do you recall Dr. -- I mean, Mr. Lindstrom's testimony with regard to zero values?

A. I'm happy to take a look at it.

(Pause)

MS. PLOVNICK: May I approach the witness?

JUDGE BARNETT: You may.

MS. PLOVNICK: It is Exhibit 6017.

JUDGE STRICKLER: Which exhibit number, counsel?

MS. PLOVNICK: 6017.

JUDGE STRICKLER: Thank you.

BY MR. OLANIRAN:

Q. Do you have a copy in front of you?

A. Yes, I do.

Q. Of Mr. Lindstrom's testimony?

A. Yes, I do.

Q. Now, let's go to page 5. Look at the first -- well, that paragraph Roman numeral V.

And let me just read that quickly so that we can move on. Mr. Lindstrom says in his testimony that: "One concern raised in past

Phase II proceedings, and which may be raised also in the allocation phase of this proceeding, is the so-called zero viewing instances that appear in Nielsen's custom analysis of national household metered viewing data. The appearance of these zero viewing instances is consistent with what I would expect to find in a custom analysis of viewing to distant signals by cable subscribers, for at least two reasons.

"First, it is important to recognize that Nielsen's custom analysis excluded all distant viewing to programs that are not compensable in this proceeding. And this included distant viewing to ABC, CBS, and NBC network programs that were not simultaneously broadcast on WGN's local feed and WGN's satellite feed known as WGNA. Where non-compensable programs aired, Nielsen's custom analyses properly reported a zero viewing value.

"Second, the amount of actual viewing minutes to certain distant signals is very small. Where the viewing minutes to particular distant signal programs were so small as to be

statistically insignificant, Nielsen's custom analysis would assign a zero viewing value."

Now, does that explain any of the missing data issues that we just discussed?

MR. GARRETT: Your Honor, may I just have a clarification here?

JUDGE BARNETT: Yes.

MR. GARRETT: In the language that Mr. Olaniran read here, there is a reference to the removal of the ABC, NBC, CBS programming. We specifically asked about that statement during the discovery process to get further clarification.

And the Program Suppliers told us that that particular sentence was included by error, that this was actually just sort of a cut and paste from some earlier testimony of Mr. Lindstrom.

And I, frankly, hadn't noticed that whatever they uploaded here and have admitted, that they still have this language in here. But I believe it was in error and so stated in a letter dated April 12th, 2017 to us.

MR. OLANIRAN: I think Mr. Garrett is correct, that with regard to that reference,

the sentence that starts with "this included" and ends with "WGNA."

JUDGE BARNETT: Thank you. Mr. Bennett, did you follow? Just pretend that sentence is not there.

THE WITNESS: Okay.

JUDGE STRICKLER: Does that make second, in that quote on page 5, the only rationale for what we're calling the zero viewing?

MR. OLANIRAN: That would be -- that would be correct, yeah.

JUDGE STRICKLER: Okay.

MR. OLANIRAN: Well --

JUDGE BARNETT: Mr. Bennett, we have heard this testimony before in other contexts.

What we have heard from Dr. Gray is, for instance, if you do a sample of 100 people in Manhattan and your objective is to determine the relative value of different colors of jelly beans based upon consumption, and your sample is so small that you don't run across anybody who says green, but you still know that somewhere in Manhattan there are people eating green jelly beans because they are still being

sold.

So what he has done is take a small sample, aggregate it up to come up with a number.

Now, I might be misstating Dr. Gray's testimony.

JUDGE STRICKLER: I think, I think he did a jelly bean sample, if I am remembering it correctly, but he also, with regard to people in New York City, for example, he wanted to sample for the people who were left-handed.

And he said he would look at 100 people and, if he got none of them were left-handed, he wouldn't assume from that result that there were no left-handed people in New York.

So he would use the -- he would -- he would project a certain amount based on the sampling that he did, where he did have in some other sample local viewing, to mix metaphors, if you will, and say, no, there have to be some and I am going to use the data I have from this other sample to let me know how many left-handed people there are in New York. I think that's the same concept.

JUDGE BARNETT: Right. So my question is, is it not a valid approach to take some data you know, for instance, local viewing, and develop a relationship to data you don't know, such as distant viewing, when the categories are the same, and you know that zeros are not really zero.

And for one reason Nielsen says they are just too few to count, so they don't put anything in there. And for another, just because the meters say zero doesn't mean nobody in the country is watching that. Okay.

So that's really where the crux of it is. And we have in the distribution phase had to deal with this zero viewing many times. So I would be interested to know what you have to say on that.

THE WITNESS: Sure. So in principle when you -- so if we step back here, the relationship that's of interest, or purportedly of interest here, is between local viewing and distant viewing, presumably because if I have reliable local viewing, let's say in the entire population, even if I don't have distant viewing, as long as I understand the

relationship, I can plug in local and I can get distant. Okay?

The fundamental issue with the regression that's been done by Dr. Gray is he is not just looking at when he has a distant record and a local record to establish that relationship. He extends outside of what he knows. And these are the situations where he has, you know, all of these zero records.

Remember, the objective, according to Dr. Gray, is to understand what the true value of the zeros are. So if you are trying to ascertain the true relationship between distant viewing and local within a modeling framework, you should only include instances where you know both the distant and local. That's what allows you to understand the relationship between these types of variables.

Once you extend outside of that and you say, well, these are the instances, you know, in his testimony it is like 93 percent of the records, those are the ones he wants to fill in. Those are the ones he wants to estimate.

But rather than excluding them from

the model, he puts zeros in for all of those distant viewing records and then says, now let's take a look at what the relationship is between local and distant.

It's local zero, local zero. That's going to distort the true relationship because he is now in the econometric setting trying to -- he is passing that to the statistical procedure and saying, tell me what the relationship is.

I think an analogy would be something like if I -- if I had data on height and weight and there is a relationship between these two, I want to know on average people of certain heights, how much do they weigh. Okay?

And I have data, let's say, for everyone in this room. I know their heights. I don't know everyone's weight. I know half of their weights. Okay?

So I could take that half and I could say: Well, what is the relationship between height and weight? And then I would extend out to the rest of the people for which I only know their height but not their weight.

In this context what's being done here

by Dr. Gray is he is saying: For every person whose weight I don't know, I'm going to set it to zero, and now I'm going to go and analyze what is the relationship between height and weight.

Well, now it is completely distorted. I have got a whole bunch of people who are -- have height but don't weigh anything at all. And that relationship is just completely then biased and distorted and should not be relied on to predict outside of what you know.

JUDGE BARNETT: Thank you.

JUDGE STRICKLER: Let me ask you, building on that, going back to page 5 of Mr. Lindstrom's testimony, where it says the word second, which is now the only rationale for the zero, do you see where I am?

THE WITNESS: Yes.

JUDGE STRICKLER: I'm quoting now: "The amount of actual viewing minutes to certain distant signals is very small. When the viewing minutes to particular distant signal programs was so small, it has to be statistically insignificant, Nielsen's customer analysis would assign a zero viewing value."

That at least suggests to me that what he is saying is we have a bad sample so we just do something else. Am I reading that wrong?

In other words, there is so many zeros that it's not a good sample to use, so we're just going to add -- we're just going to change the zeros to something, based on the few data points that we do have. Is that what it says?

THE WITNESS: I might need some clarification. So this is Mr. Lindstrom's testimony here?

JUDGE STRICKLER: Right.

THE WITNESS: He is not -- he is not, I think -- or he is disconnected from the whole imputation analysis. And what I understand Mr. Lindstrom to be saying is that, you know, where they couldn't -- where Nielsen could not reliably tell you how many distant viewers there are, so when it is so small so as to be statistically insignificant, so you could have, you know, a household count of two, but you have uncertainty with respect to your estimate, so they essentially are building, like, you know, they have a confidence interval for that.

They are saying, you know, there is

some error, some noise in this process, but we're not going to attach a value to it unless we have sufficient confidence in it.

That's what I -- that's what my interpretation would be from -- from that sentence.

JUDGE STRICKLER: Thank you.

BY MR. OLANIRAN:

Q. And so in your view, you didn't understand Dr. Gray's analysis to be predicting -- to be attempting to predict viewing in every quarter-hour of every single program; you only interpreted it as trying to predict viewing only to the zero cells, if you will?

A. Dr. Gray -- so if we go back to the height/weight analogy I gave a minute ago --

Q. No, actually let's stick with what you think Dr. Gray was trying to do.

A. I can tell you what he did. And that is he predicted values out of this biased regression. Right? The data he put into it was not an accurate depiction of the actual data, even according to him.

The predictions that are coming out are all -- he predicts distant viewing for

every single quarter-hour --

Q. Correct.

A. -- in his regression data. He predicts that. Then what --

Q. Then -- I'm sorry.

A. Then what you do with that is another question. The regression model will always -- can always produce a prediction.

Q. Was the -- was viewing data the only variable in his regression analysis?

A. No, it was not.

Q. What else was in it?

A. He had dummy variables for quarter-hour. He also included I think what he called local ratings. Oh, and he also used a program, program categories from the Encore -- excuse me, the Tribune, the TMS data.

I could be missing something. I have to go back and look at his testimony to see all of the co-variates.

MR. OLANIRAN: I have no further questions, Your Honor. Thank you.

JUDGE BARNETT: Thank you, Mr. Olaniran.

Mr. Dove or Mr. Cho, which one?

MR. DOVE: Mr. Dove.

JUDGE BARNETT: Okay. Mr. Dove.

CROSS-EXAMINATION

BY MR. DOVE:

Q. Good afternoon, Dr. Bennett. My name is Ron Dove and I represent the Public Television Claimants.

A. Good afternoon, Ron.

Q. If we can turn to figure 4 of your direct testimony, Exhibit 2006, and this figure is entitled Total Minutes Airing on Distant Signals By Year, in the Millions.

And I just direct your attention, Dr. Bennett, to the column for PTV, for Public Television. Would you agree that Public Television is the second largest category when it comes to minutes of distant signal programming?

A. I would agree that's what the table says based on, so just to be clear, total minutes airing on a distant signal, yes, that's right.

Q. And would you agree that Public Television has more distant signal minutes than Joint Sports, Commercial Television,

Devotional, and Canadian Claimants combined?

A. I need a calculator. Let's see. So it looks like, based on my late-afternoon arithmetic, that the PTV total minutes are greater than the sum of the JSC, CTC, Devotional and Canadian in each year. That looks to be correct.

Q. And just so I understand this table, you know, if a station was retransmitted by more than one cable system, how would those minutes be calculated?

A. Can you repeat that? I'm sorry. I just got caught up in something.

Q. Sure. If a station was retransmitted by more than one cable system, how would those minutes be calculated? Would they just be calculated one time or would they be basically multiplied by the number of cable systems that carried that station?

A. Figure 4 here is just a summary of the minutes by the retransmitted station, so each retransmitted station in this table is included once and it gets a weight of one.

Q. Okay. Do you know, or do you recall, you know, roughly what percentage of the

minutes for, let's take Joint Sports Claimants, were attributable to WGNA?

A. No. As I testified earlier, I flagged the programs as compensable/non-compensable on WGNA by Claimant type, but I didn't -- I don't recall tracking the shares by, you know, of different Claimant types.

Q. And if I wanted to go figure that out, for example, where would I look for that information?

A. The database that I created has that information in it and would require just simply, you know, adding up these minutes. They are reported directly in the database.

Q. Okay. I would like to turn now to figure 10 of your rebuttal report, Exhibit 2007.

I believe you testified about this earlier. This figure is entitled Proportion of Educational Stations in Dr. Gray's Sample Versus the Population.

Do you see that?

A. I do, yes.

Q. And just to be clear, as I understand it, this shows that Dr. Gray under-sampled

Public Television stations in three of the four years. Is that right?

A. Yes. Dr. Gray's samples under-represent educational stations in 2010, 2011, and 2013.

Q. And is a study that under-samples educational stations a reliable study?

A. It depends on what that study is being used for.

Q. And what's your basis for that? What makes you say "it depends"?

A. Well, if you are using that sample to study something that's uncorrelated with station type, that is unrelated to station type, then that may not be a significant factor.

Q. But let's just say for purposes of this proceeding, if a -- is a study that under-samples educational stations a reliable study if it is being used for the purpose of determining relative values of programming?

A. In -- so what I testified to earlier, and I think answers your question, is that this particular sample, when relied on to extrapolate the share of PTV minutes, would

yield biased estimates consistent with the biases that we see in the figure.

Q. So a study that under-samples educational stations would yield bias -- would yield bias relative value estimates as to educational stations, correct?

A. Yeah, if uncorrected and unaddressed, yes.

Q. I would like to turn now to page 17 of your rebuttal testimony. I will put this on the ELMO. Okay.

Dr. Bennett, one of your criticisms of Dr. Gray's methodology is that his assignment of programs to Claimant categories is flawed and unreliable.

Is that correct?

A. Yes, that was -- yes.

Q. Does this criticism of his methodology have any impact on Public Television's share?

A. This criticism has an effect on all Claimants' shares, to the extent that you categorize incorrectly and, for example, over, you know, assign too many programs or inflate the share of one Claimant, you by definition are driving down the shares of other Claimants.

Q. And how would that impact public -- well, let me strike that.

I mean, how would that impact Public Television? My understanding from reading this is that none of these, within the Public Television category, as you testified earlier, you know, all programming within that category is compensable.

And so you didn't even really, you know, go in and assess particular programs within that category.

I understand that this criticism might affect the relative relationship of all the -- of the values of all the other categories, but as to Public Television, it would have no impact, correct?

A. Yeah, that appears to be correct. If -- so just give me one moment here. Right. So assuming that Dr. Gray had correctly categorized the PTV programming, these other issues with this categorization would only cause distortions in their shares.

Q. And do you have any basis for believing that Dr. Gray did not properly account for Public Television programming?

A. Figure 1 in my -- so it is page 6 of my rebuttal testimony, it does show that -- I will wait for people.

Q. So figure --

A. Figure 1 on page 6, which is the average distribution of Gray's categorized programs by station type.

Q. Hold on a second. Let me put it on the screen.

A. So in the second row, the educational station type, those should all be PTV minutes. Dr. Gray does in his categorization assign some educational minutes to the Devotional Claimants.

This figure here is an on average, so it is not going to clearly spell out the magnitude of that error.

I believe that's also in a footnote, footnote 11, page 6, as well. It spells out this evidence, this categorization issue there.

Q. But to the extent, as I understand it, the extent to which Dr. Gray mistakenly included devotional programming that was on Public Television, included that in the Devotional category, that would result in a

bias that would reduce the share of Public Television, correct?

A. Yes, if we're just interested in accounts of programs and the accounts of airings. In the other analysis, the distant viewing analysis, all bets are off.

Q. Let's turn now, Dr. Bennett, to figure 18 of your rebuttal report. I don't recall whether you testified about this earlier. But if you could at least, if you did, just refresh us on what does this table show?

A. I just want to look at my report just to be 100 percent sure that I got this right.

Q. Sure. That table is on page 22.

A. Okay. So in Dr. Gray's regression analysis -- yes, that's right. In Dr. Gray's regression analysis, he did not include the sampling weights when estimating the coefficients of his model.

This figure, figure 18, shows what Dr. Gray would have obtained had he included the sampling weights in that regression.

Q. And how does the use of sampling weights impact Public Television's share?

A. So it looks to be mixed. In 2010, the

PTV share goes down slightly. It then is higher in 2011 and 2012 by including the sampling weights, and would be lowered in 2013. So it is a mixed effect.

Q. Okay. And I know you are not endorsing Dr. Gray's methodology, but would you agree with me at least that the recalculation you have made in this table, or the calculations that you have made in this table are at least a small improvement over what Dr. Gray did in his analysis?

A. So I think my testimony here was that the regression, the regression itself, the estimates coming out of it, don't reflect the relationship in the population.

And then if you included the sampling weights for the purpose of trying to reflect the relationship in the population, these are the numbers you would get.

The study itself, though, and the regression itself is, as I have testified, is fundamentally flawed, and it is difficult for me to characterize this as an improvement. It's -- it's an assessment of what he would have obtained had he included the sampling

weights.

Q. And you think he should have included the sampling weights, correct?

A. I, generally speaking, if running a regression where you have an equal sampling weight, if your objective is to estimate the relationship that holds in the population, then, yes, you should include the sampling weights in that regression.

Q. I would now like to turn to Figure 22 of your rebuttal report. And I believe you also testified about this figure as well. But, again, just given it is late afternoon, if you could just again summarize what you were trying to get at in this Figure 22 labeled Aggregate Difference Between Distant Household Quarter-Hour Shares, Estimated By Dr. Gray and Reported By Nielsen.

A. Dr. Gray, one way that he could have calculated shares would have been to rely directly on the information in the Nielsen data and not on any other imputed values. Had he done that -- so this table is showing a comparison of what he would have gotten in terms of shares relative to what he actually

obtained.

And it is showing, for example, that in 2010 Dr. Gray's imputation relative to the actual Nielsen records causes the Canadian share to fall by .3 percent, percentage points, causes the CTV Claimant's share to fall by 11.23 percent, causes the Devotional to go up by .8 percent, causes the Program Suppliers to go up by 11.98 percent, and causes the PTV Claimant's share to go down by 2.08 percent, and causes the JSC share to go up by .83 percent.

JUDGE STRICKLER: And, again, just so the record is clear because we talked about this earlier, when you say percent up or down, you mean percentage points?

THE WITNESS: Percentage points, correct, yes.

JUDGE STRICKLER: Thank you.

BY MR. DOVE:

Q. And so just -- and I think I understand this now, so let's take the Commercial Television Claimants, for example. I think in paragraph 65 of your report you focus on them specifically.

What was -- the impact over the four years on Commercial Television's share, what does this chart show?

A. So it is showing, in the CTV column, it shows the impact of Dr. Gray's imputation methodology relative to what was in the -- reported in the Nielsen data. It shows that the CTV share in 2010 dropped by 11.23 percent, using Dr. Gray's imputation.

His imputation results in the CTV's share going down by .76 percentage points in 2011, down by 1.68 percentage points in 2012, and down by 4.07 percentage points in 2013.

Q. So it is biased against Commercial Television for those years for that reason, correct?

A. Dr. Gray's imputation effectively eliminates -- excuse me, these are shares.

It disproportionately gives distant viewing households to other Claimant groups relative to the CTV. That's what that tells you. Their share is -- is going down.

JUDGE STRICKLER: The comparison you are making is between the imputation done by Dr. Gray and what he would have come up with if

he had only used the Nielsen data that actually showed positive distant viewing; is that right?

THE WITNESS: Correct. And if he had imputed a zero, you would still get the same result.

JUDGE STRICKLER: The same result --

THE WITNESS: Like --

JUDGE STRICKLER: -- as if they just weren't there at all?

THE WITNESS: Right.

JUDGE STRICKLER: Thank you.

BY MR. DOVE:

Q. And so it had a negative impact on Commercial Television in terms of share; is that fair?

A. Yes.

Q. And that same impact plays out with regard to Public Television, correct; it had a negative impact in all four years as to Public Television, correct?

A. In all four years PTV's share is -- is lower under Dr. Gray's imputation than under the shares calculated directly from Nielsen.

Q. And I would now like to turn to figure 24, which you testified earlier are the

confidence intervals for Dr. Gray's shares with his distant viewing estimates treated as true observations.

Do you see that?

A. Yes, I do.

Q. Focusing in on the ranges of the confidence intervals for Public Television, what do those ranges for Public Television represent?

A. So these are the 95 percent confidence intervals that Dr. Gray would have obtained had he correctly -- had he correctly treated his sampling as stratified cluster sampling.

So these are the confidence intervals that he would have obtained had he done that.

Q. Is it fair to say that these percentages represent a floor and a ceiling for Public Television's royalty share as estimated by Dr. Gray?

A. So the "as estimated by Dr. Gray" part, it is not clear how to answer that.

Q. Well, let me ask it. It is a floor -- is it fair to say it is a floor and a ceiling for something? Maybe you can define what that something is. I am just trying to get a sense

of what's being represented here. It is a floor and a ceiling for what measure?

A. So these estimates -- so, first of all, the confidence intervals that are reported here are all centered on the share estimates as calculated by Dr. Gray.

So to the extent that there is bias in those, that's going to cause those intervals to be incorrectly centered.

Now, with respect to the floor and the ceiling aspect, the floor -- so the upper and lower bounds here are calculated ignoring the uncertainty that's inherent in his imputation.

I would argue that the true floor and ceiling are actually, you know, the floor would be much lower or potentially much lower and the ceiling potentially much higher than even what's reported here.

Q. And, you know, I understand -- maybe this is what you just said -- but I understand you don't believe these shares are reliable estimates of the parties' relative value. Is that fair?

A. I don't believe that the shares are reliable estimates of the Claimants' shares.

And I also believe that these confidence intervals understate the degree of imprecision that is inherent in these estimates.

Q. And one of the reasons you don't believe these estimates are reliable is because there are various biases that you have identified, correct?

A. Yes, there are biases that I have identified.

Q. And some of these biases work in favor of -- in the instance of Public Television, as we have discussed, some of these biases work in favor of Public Television and some might work against; is that right?

A. I think, for Public Television, I think the biases that I had described earlier were with respect to the proportion of educational stations that were biased downwards in 2010, '11, and '13, and biased upwards in 2013.

MR. DOVE: I have no further questions. Thank you, Dr. Bennett.

JUDGE BARNETT: Any further cross-examination of Dr. Bennett? Any redirect examination?

MR. ERVIN: No redirect, Your Honor.

JUDGE BARNETT: Okay. Thank you, Dr. Bennett. You may be -- oh, anything from the Bench?

JUDGE STRICKLER: No.

JUDGE FEDER: Nothing.

JUDGE BARNETT: Thank you, Dr. Bennett. You may be excused.

THE WITNESS: Thank you.

JUDGE BARNETT: I see that Ms. McLaughlin will be after the 5th of March. Will Mr. Hartman be available on Monday?

MR. GARRETT: Your Honor, we had discussed with the parties having Dr. Israel and Mr. Hartman go right after each other starting on the 12th.

JUDGE BARNETT: Okay.

MR. GARRETT: The following Monday. I believe the Canadians are up next here, followed by Ms. McLaughlin.

JUDGE BARNETT: Thank you. Mr. Satterfield?

MR. SATTERFIELD: Yes, our plan, we have discussed it with the other parties to try to streamline the proceeding. Two of our

witnesses, we have now discussed having them appear on paper only. Beverly Kirshenblatt and Danielle Boudreau would appear only on paper.

JUDGE BARNETT: And that is agreed or are you still discussing?

MR. SATTERFIELD: No, that's agreed.

JUDGE BARNETT: Great. Thank you.

MR. SATTERFIELD: So then we would start with our expert witnesses Monday morning and possibly into part of Tuesday is what we are hoping.

JUDGE BARNETT: Thank you. Ms. Plovnick.

MS. PLOVNICK: Your Honor, the parties have agreed to accommodate Dr. Frankel's health-related conflict, surgery starting on the 9th, and so they are going to allow him to follow the Canadian Claimants and take him out of order.

JUDGE BARNETT: Thank you.

MR. SATTERFIELD: Just the parties' understanding, Shum will be here on Tuesday.

MR. GARRETT: Who is first?

MR. SATTERFIELD: Dr. Conrad.

JUDGE BARNETT: Thank you. Now, we

have the issue with the 21st. And we have the issue of only having one Friday available.

Loathe as I am, and maybe it isn't necessary, but the 26th, which is the following Monday, we could be made available. I haven't made the reservations yet. So just on the outside chance I wouldn't get away, I can be here, if that's a day we need.

So I will give you some time to let us know about that before I book any flights to get out of Dodge. Mr. Garrett?

MR. GARRETT: Your Honor, at least my hope is that we will get this done by the 20th. That's what I think all the parties are working for.

I think your offering that Friday would certainly help, but I think our fervent hope is that we get it done by the 20th.

JUDGE BARNETT: We all have the same goal. I realize that. It is just, you know, some things happen. People get ill. Planes get missed. Things happen. Schedules get -- examinations run long. You just never know.

So I appreciate your concerted and cooperative efforts. As for now, we will be at

recess until Monday morning at 9:00 o'clock.

(Whereupon, at 4:27 p.m., the hearing recessed, to reconvene at 9:00 a.m. on Monday, March 5, 2018.)

C O N T E N T S

CERTIFICATE

I certify that the foregoing is a true and accurate transcript, to the best of my skill and ability, from my stenographic notes of this proceeding.

3-1-18 _____
Date Signature of the Court Reporter

3-1-18 _____
Date Signature of the Court Reporter

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